Vol. 898 Number 2

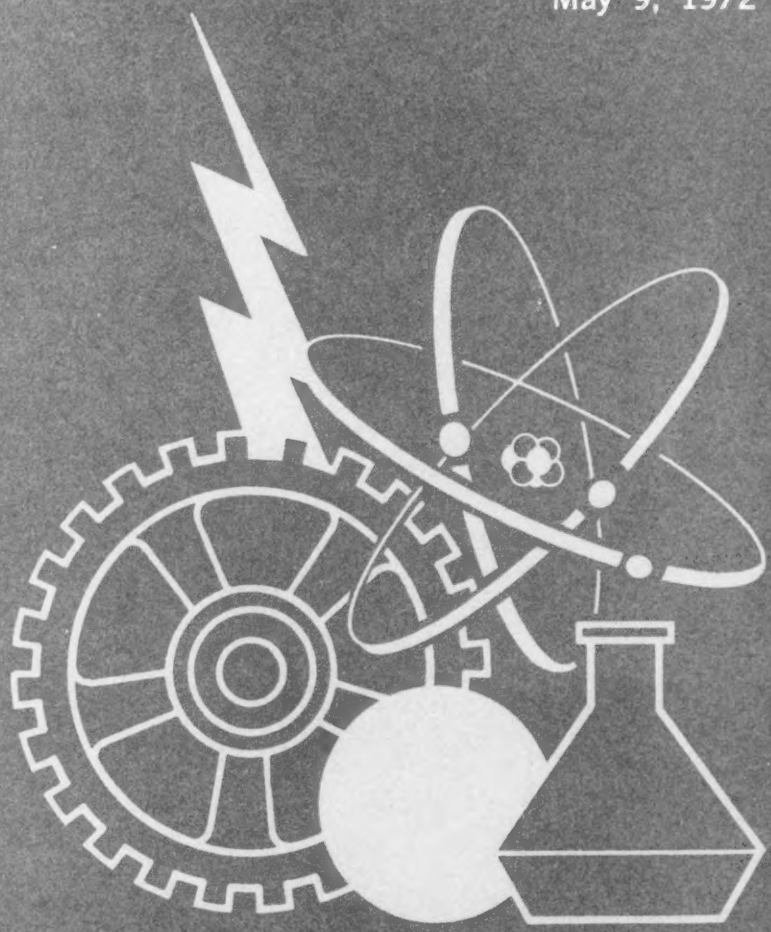
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

May 9, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 9, 1972 Volume 898 Number 2

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PATENT OFFICE NOTICES

Concordance: United States Patent Classification to International Patent Classification

A revised and updated edition of the "Concordance: United States Patent Classification to International Patent Classification" has been published and is available from the Superintendent of Documents, U.S. Government Printing Office, for $1.50. This second edition is a revision of the edition of April 1969, and contains about 3,000 changes, corrections and additions suggested by users of the book. It includes all new U.S. classes published up to and including November 1971.

Apr. 12, 1972.

W. W. BURNS, JR.,
Administrator, Office of Search Systems and Documentation.

Certificates of Correction for the Week of May 9, 1972

3,311,616	3,600,154	3,612,151	3,617,561
3,453,281	3,602,949	3,612,500	3,617,622
3,473,316	3,603,667	3,612,793	3,617,789
3,479,261	3,603,875	3,613,031	3,617,870
3,484,416	3,604,057	3,613,639	3,617,901
3,514,017	3,604,935	3,613,679	3,617,919
3,518,296	3,605,713	3,613,792	3,617,920
3,520,779	3,607,604	3,613,883	3,617,936
3,521,041	3,607,145	3,613,917	3,618,579
3,528,473	3,607,811	3,613,957	3,618,632
3,533,548	3,607,830	3,614,064	3,618,668
3,540,579	3,607,951	3,614,107	3,619,121
3,541,162	3,608,062	3,614,145	3,619,148
3,550,749	3,608,119	3,614,176	3,619,282
3,557,370	3,608,184	3,614,372	3,619,359
3,557,974	3,608,456	3,614,432	3,619,386
3,558,559	3,608,502	3,614,452	3,619,389
3,558,737	3,608,615	3,614,488	3,619,401
3,560,700	3,608,660	3,614,523	3,619,421
3,567,788	3,608,731	3,614,600	3,619,433
3,572,777	3,608,971	3,614,628	3,619,520
3,573,193	3,609,064	3,614,734	3,619,585
3,575,555	3,609,145	3,615,011	3,619,666
3,576,575	3,609,158	3,615,167	3,619,764
3,577,177	3,609,173	3,615,169	3,619,780
3,578,957	3,609,185	3,615,231	3,619,788
3,579,962	3,609,186	3,615,255	3,620,000
3,581,298	3,609,196	3,615,280	3,620,040
3,581,779	3,609,200	3,615,511	3,620,125
3,582,961	3,609,236	3,615,578	3,620,597
3,583,125	3,609,272	3,615,612	3,620,897
3,583,903	3,609,378	3,615,772	3,620,999
3,584,141	3,609,389	3,615,814	3,621,796
3,585,464	3,609,442	3,615,854	3,621,894
3,588,888	3,609,502	3,615,881	3,622,119
3,590,560	3,609,541	3,616,126	3,622,229
3,590,742	3,609,574	3,616,297	3,622,254
3,591,581	3,609,632	3,616,303	3,622,303
3,592,457	3,609,700	3,616,320	3,622,309
3,593,309	3,609,701	3,616,392	3,622,347
3,593,408	3,609,743	3,616,409	3,622,388
3,594,686	3,610,007	3,616,459	3,622,482
3,594,788	3,610,139	3,616,660	3,622,547
3,594,823	3,610,314	3,616,763	3,622,594
3,595,788	3,610,445	3,616,837	3,622,652
3,597,100	3,610,480	3,616,908	3,622,683
3,598,269	3,610,686	3,617,033	3,622,719
3,598,799	3,611,048	3,617,182	3,622,967
3,598,994	3,611,049	3,617,244	3,623,008
3,599,162	3,611,113	3,617,307	3,623,382
3,599,349	3,611,207	3,617,321	3,623,454
3,599,610	3,611,261	3,617,351	3,623,530
3,599,804	3,611,412	3,617,440	3,623,532
3,623,555	3,624,092	3,625,626	3,627,143
3,623,602	3,624,208	3,625,696	3,627,973
3,623,608	3,624,258	3,625,753	3,629,896
3,623,993	3,624,468	3,626,010	3,631,521
3,624,014	3,624,529	3,626,269	3,631,974
3,624,068	3,625,086	3,626,746	3,635,244
3,624,080	3,625,284	3,627,027	3,642,447

Disclaimers

3,225,077.—*Frederic Charles Schaefer,* Munich-Solln, Germany and *Kenneth Robert Huffman,* Stamford, Conn. N-CYANOIMIDATES AND PROCESSES FOR PREPARING SAME. Patent dated Dec. 21, 1965. Disclaimer filed Jan. 12, 1972, by the assignee, *American Cyanamid Company.*

Hereby enters this disclaimer to claim 2 of said patent.

3,530,790.—*Donald P. Post,* Palatine, Ill. ROOF TRUSS FORMING MACHINE. Patent dated Sept. 29, 1970. Disclaimer filed Dec. 30, 1971, by the assignee, *Structomatic, Inc.*

Hereby enters this disclaimer to claim 12 of said patent.

3,556,101.—*Steven G. Economou,* Wilmette, Ill. SURGICAL SUCTION ASSEMBLY. Patent dated Jan. 19, 1971. Disclaimer filed Dec. 27, 1971, by the assignee, *Hollister Incorporated.*

Hereby enters this disclaimer to claims 9 and 10 of said patent.

3,596,126.—*Susumu Yoshida* and *Akio Ohgoshi,* Tokyo, *Senri Miyaoka,* Kanagawa-ken, and *Yoshiharu Katagiri,* Tokyo, Japan. CATHODE RAY TUBE WITH PARALLEL SLIT GRID STRUCTURE ADJACENT COLOR DISPLAY SCREEN. Patent dated July 27, 1971. Disclaimer filed Apr. 7, 1972, by the assignee, *Sony Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to June 3, 1986.

Dedication

3,270,063.—*Joseph Fath,* Barrington, R.I., and *John M. Kolyer,* Seekonk, Mass. METHODS OF MAKING PRIMARY MERCAPTANS. Patent dated Aug. 30, 1966. Dedication filed Mar. 29, 1972, by the assignee, *Teknor Apex Company.*

Hereby dedicates to the Public the remaining term of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 21, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-11-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-04-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-25-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	7-21-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-03-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-01-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-06-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	2-03-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-08-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-04-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	3-17-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	2-03-71

Expiration of patents: The patents within the range of numbers indicated below expire during April 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,705,322 to 2,707,276, inclusive
Plant Patents..... Numbers 1,374 to 1,388, inclusive

REISSUES

MAY 9, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

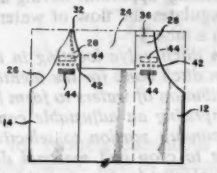
27,348
DISPOSABLE OFFICE GOWN

Theodore Bradley, 147 Eldorado St., Monterey, Calif. 93940

Original No. 3,399,406, dated Sept. 3, 1968, Ser. No. 584,322, Sept. 27, 1966, which is a continuation-in-part of Ser. No. 534,903, Mar. 16, 1966. Application for reissue Aug. 28, 1970, Ser. No. 68,058

Int. Cl. A41d *9/00*

U.S. Cl. 2—114 4 Claims



The present application relates to a disposable examination gown of the type adapted for hospital or clinical use wherein portions of the gown may be opened for observation and examination of the patient, then re-sealed for normal wear of the gown upon conclusion of the examination.

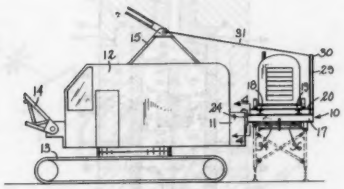
27,349
PLATFORM ATTACHMENT FOR CRANES

Roger S. Chapman, Jr., 93 Mohawk Drive, Wallingford, Conn. 06492, and Philip Pilletere, Jr., 189 Winslow Drive, West Haven, Conn. 06516

Original No. 3,481,488, dated Dec. 2, 1969, Ser. No. 684,349, Nov. 20, 1967. Application for reissue Sept. 19, 1970, Ser. No. 65,029

Int. Cl. B66c

U.S. Cl. 212—1 8 Claims



This disclosure relates to a platform attachment for cranes for carrying auxiliary equipment such as air compressors. The platform has foldable legs with each of the legs carrying jacking means so that the platform may be supported on its own legs and moved into engagement with attachment means on the crane. When the platform is supported on the crane the legs are folded beneath the platform.

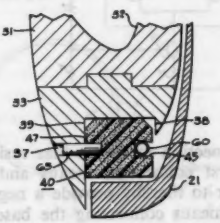
27,350
LEAKAGE-LIMITING DEVICES FOR ROTATIVE MACHINERY APPLICATION

Joseph M. Jaeger, Woodcliff Lake, N.J., assignor to Jemco Seals, Inc., New York, N.Y.

Original No. 3,460,843, dated Aug. 12, 1969, Ser. No. 514,887, Dec. 20, 1965. Application for reissue Nov. 12, 1970, Ser. No. 89,154

Int. Cl. F16j *15/48*

U.S. Cl. 277—26 7 Claims



A leakage-limiting device to be situated between rotary and non-rotary components of a machine. The device includes a leakage-limiting ring to surround a rotative member of the machine with clearance under static conditions. A means is provided for fixing the ring to the non-rotative member of the machine, and a means is provided for retaining this fixed relationship under static conditions. The ring has a low coefficient of friction which will prevent any damage to the rotative member if there should be engagement between the latter and the ring during starting up of the machine. On the other hand, the ring has a coefficient of thermal expansion substantially in excess of those of the materials from which the rotative and non-rotative machinery members are constructed, so that during increase of the temperature of the machine parts to their normal operating temperatures the ring will tend to expand away from the rotative member. However, the positioning and retaining means act on the ring to restrain the latter from radial and circumferential expansion during the temperature rise, and instead to constrain the ring to expand centripetally toward the rotative machine member, thus reducing the clearance with resulting decreased leakage and increased efficiency.

27,351
DIFFERENTIAL DC AMPLIFIER

Donald R. McGraw and Jerald G. Graeme, Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

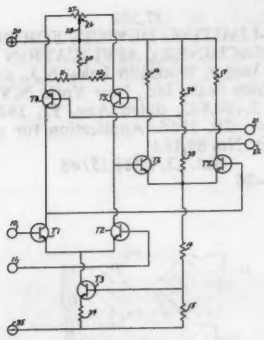
Original No. 3,440,554, dated Apr. 22, 1969, Ser. No. 579,340, Sept. 14, 1966. Application for reissue Dec. 14, 1970, Ser. No. 98,219

Int. Cl. H03f *3/04, 3/68, 1/32*

U.S. Cl. 330—30 D 10 Claims

1. In a transistor differential amplifier having: a first and a second connection means for connection to a potential bias source, a pair of input transistors for receiving an imput signal between the base electrodes thereof, and a common mode negative feedback path, said path

including a negative feedback resistor connected to said second connection means, the improvement comprising: a pair of dynamic load transistors each having the emitter-collector circuits thereof connected in series with the emitter-collector circuits of a different one of said input transistors and connected [through a variable resistance]



to said first connection means; a bias resistor connected between said first connection means and said negative feedback resistor to thereby provide a negative feedback bias loop; and means connecting the base electrodes of said dynamic load transistors in parallel with each other and to said bias resistor.

27,352

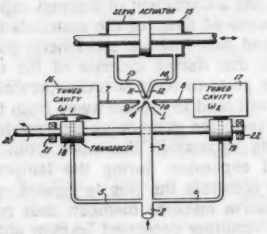
FLUID CONTROL SYSTEM

Hansjoerg Stern, Scotia, N.Y., assignor to General Electric Company

Original No. 2,233,522, dated Feb. 8, 1966, Ser. No. 283,813, May 28, 1963. Application for reissue Mar. 7, 1967, Ser. No. 633,323

Int. Cl. F15b *13/02*

U.S. Cl. 91—3 **1 Claim**



The controller element of a fluid control system is a fluid amplifier circuit which supplies a fluid force to an actuator element for restoring a system parameter to its desired value. A transducer senses the system parameter and converts it to a pulsating flow of control fluid of frequency proportional to magnitude of the system parameter. First and second tuned resonant devices, such as tuned cavities, connected to the output of the transducer have resonant frequencies respectively above and below a frequency corresponding to the desired value of the system parameter. The output fluid flows of the first and second tuned resonant devices are supplied to the control nozzles of the fluid amplifier and have magnitudes of flow respectively proportional to the deviation of the system parameter above and below the desired value.

27,353

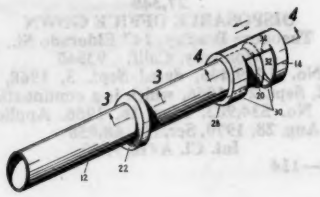
IRRIGATION CONTROL

Ralph E. Shettel, Rte. 1, Twin Falls, Idaho 83301

Original No. 3,400,909, dated Sept. 10, 1968, Ser. No. 567,444, July 25, 1966. Application for reissue Oct. 16, 1969, Ser. No. 877,915

Int. Cl. F16k *3/00*

U.S. Cl. 251—147 **4 Claims**



[A water metering apparatus having an adjustable inlet device which regulates the flow of water to the field corrugates through a tube.]

An irrigation ditch valve locating in the earth or concrete lined open ditch bank for the identical metering and automatic distribution of waters to farm lands. The metering means comprising an adjustable cap or gate portion acting with a conduit portion to selectively size a water inlet responsive to crop and seasonal demands. A ditch valve system typically feeding individual corrugates and furrows, or accumulating to feed between borders and dikes through equal spacing and level alinement that affords valve identity through uniform submersion below the checked water line.

27,354

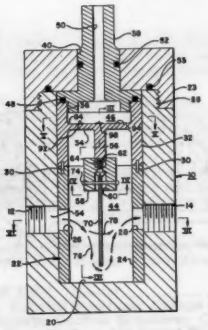
COMBINED RATE OF FLOW, PRESSURE AND TEMPERATURE GAGE

Donald Wiebe, Sewickley, and Richard B. Doorley, Pittsburgh, Pa., assignors to William S. Hansen, doing business as A. Stucki Company, Pittsburgh, Pa.

Original No. 3,354,716, dated Nov. 28, 1967, Ser. No. 397,171, Sept. 17, 1964. Application for reissue Nov. 28, 1969, Ser. No. 880,811

Int. Cl. G01f *1/00*; G01k *13/02*

U.S. Cl. 73—198 **25 Claims**



A unitary probe having four strain gages and a cantilever vane mounted on a wall of the probe. Displacement of the vane due to fluid flow is measured by two of the strain gages while another two sense pressure when the probe is adjusted to stop fluid flow. Temperature may be determined by appropriate connection of the gages into a strain gage bridge.

27,355

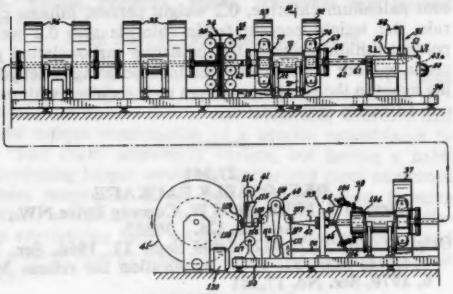
APPARATUS FOR FORMING TUBULAR REINFORCED PLASTIC MEMBERS

Bruno Bengt Skoggard, King City, Ontario, Canada, and William Clinton Post, Wallingford, Conn., assignors to American Cyanamid Company, Wayne, N.J.

Original No. 3,407,107, dated Oct. 22, 1968, Ser. No. 611,649, Jan. 25, 1967, which is a division of Ser. No. 323,763, Nov. 14, 1963. Application for reissue Apr. 14, 1970, Ser. No. 28,563

Int. Cl. B65h *81/00*

U.S. Cl. 156—432 18 Claims



An apparatus for forming continuous lengths of filamentary reinforced plastic pipe by means of a valve assembly which captures a non-moving slug of fluid under pressure over which an imperforate tubular flexible mandrel is continuously passed. Reinforcing filaments and hardenable plastic are applied continuously to the moving mandrel in its inflated condition by winding. Various winding patterns and layer configurations, including an outer wrap, are applied by means of guides and reels. Take-up rolls receive the wound pipe which, if not cured on the machine, is flattened after passing beyond the captured fluid slug. The pipe is then inflated and hardened in situ.

27,356

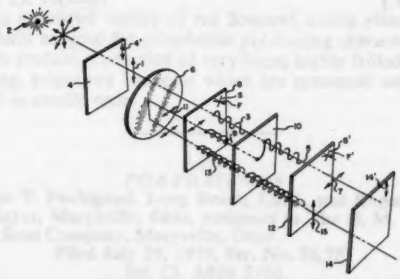
INFINITE OPTICAL IMAGE-FORMING APPARATUS

Joseph La Russa, Yonkers, N.Y., assignor to Farrand Optical Co., Inc., New York, N.Y.

Original No. 3,443,858, dated May 13, 1969, Ser. No. 529,416, Feb. 23, 1966. Application for reissue Aug. 17, 1970, Ser. No. 64,517

Int. Cl. G02f *1/24*

U.S. Cl. 350—157 6 Claims



1. Image-forming apparatus comprising a beam-splitting curved mirror, a first quarter-wave plate disposed on the concave side of the curved mirror, a second beam-splitting mirror disposed on the side of the first quarter-wave plate remote from the curved mirror, a second quarter-wave plate disposed on the side of the second beam-splitting mirror remote from the first quarter-wave plate, and a polarizer disposed on the side of the second quarter-wave plate remote from the second beam-splitting mirror, the first and second quarter-wave plates having their fast axes oriented with respect to each other at a substantially integral multiple of 90° and the polarizer having its plane of polarization oriented substantially at an odd integral multiple of 45° to the fast axis of the second quarter-wave plate.

27,357

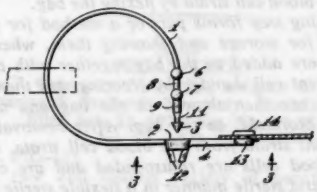
TAG ATTACHING OR BUNDLE FASTENING DEVICE

Francis G. Merser, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original No. 3,402,435, dated Sept. 24, 1968, Ser. No. 633,782, Apr. 26, 1967. Application for reissue Sept. 23, 1970, Ser. No. 74,944

Int. Cl. B65d *63/00*

U.S. Cl. 24—16 PB 9 Claims



A fastening device for attaching, bundling, affixing or other holding of one or more articles, the device comprising a filament, a socket on the filament and a head on one end of the filament adapted to snap into the socket.

27,358

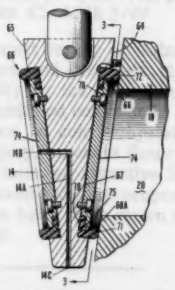
TOP ENTRY VALVE

Donald R. Nelson, Worcester, Mass., assignor to Goddard Industries, Inc., Worcester, Mass.

Original No. 3,471,122, dated Oct. 7, 1969, Ser. No. 570,920, Aug. 8, 1966. Application for reissue Nov. 18, 1970, Ser. No. 90,884

Int. Cl. F16k *3/12*; F16l *7/00*

U.S. Cl. 251—327 6 Claims



A cryogenic gate valve having a body with a full passage formed therein. A gate has opposed faces at an acute angle with recesses formed in the faces of the gate. A sealing means consisting primarily of a plastic O-ring, preferably having an L-shaped configuration, is positioned within the recesses. The sealing means is secured to the gate by a clamping element in the form of a disc positioned within the recess and engaging an inwardly extending flange of the sealing means and securing it directly to and in rigid, interengagement with the gate. Stress razors in the form of annular, sharpened, edges

project from the bottom of the recess into the sealing means to prevent it from moving laterally when the gate valve is cooled.

27,359
METHOD AND APPARATUS FOR TREATING BLOOD

John Ilg, Fitzwilliam, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Original No. 3,328,255, dated June 27, 1967, Ser. No. 331,342, Dec. 13, 1963, which is a continuation-in-part of Ser. No. 297,854, July 26, 1963. Application for reissue Nov. 24, 1969, Ser. No. 888,178

Int. Cl. A61k *17/00*; B01d *21/00*; C12b *1/00*

U.S. Cl. 424—101 48 Claims

Method of washing blood cells in a closed and sterile system and in a seal flexible bag by adding a sufficient amount of a non-electrolyte washant to the blood cells in the bag to reduce the electrolyte concentration to a point at which the blood cells are precipitated to form a lower precipitated blood cell strata and an upper spent washant strata and separating the spent washant strata from the precipitated blood cell strata by flexing the bag.

The washing step forms part of a method for freezing blood cells for storage and thawing them, wherein the blood cells are added to the bag together with an additive to prevent cell damage by freezing, are then frozen in the bag, are then thawed in the bag and are then washed, as aforesaid, in the bag. After removal of the spent washant strata from the blood cell strata, the precipitated blood cells are resuspended and are collected in a closed and sterile manner in a flexible sterile satellite bag which is sealably secured to the wash bag.

27,360
PREPARATION OF BETA-ACYLOXY-CARBOXYLIC ACIDS AND ALPHA,BETA-UNSATURATED CARBOXYLIC ACIDS BY OXIDATIVE CARBONYLATION

Kenneth L. Olivier, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Original No. 3,415,871, dated Dec. 10, 1968, Ser. No. 478,426, Aug. 9, 1965. Application for reissue Oct. 8, 1970, Ser. No. 79,320

Int. Cl. C07c *51/14, 67/04*

U.S. Cl. 260—497 A 8 Claims

Ethylenically unsaturated hydrocarbon olefins are reacted under oxidative carbonylation conditions to produce α,β-ethylenically unsaturated carboxylic acids and β-acyloxy carboxylic acids wherein the carboxylic acid portion has one more carbon than the olefin, by contacting the olefin, oxygen and carbon monoxide with an anhydrous reaction medium containing a Group VII noble metal and, as the redox agent therefor, a ferric salt soluble in the reaction medium and a soluble halide. In a specific embodiment, ethylene is converted to acrylic and β-acetoxy propionic acid by oxidative carbonylation wherein ethylene, oxygen and carbon monoxide are introduced into contact with an acetic acid containing reaction medium which also contains about 0.2 weight percent palladium chloride, 0.2 weight percent lithium chloride, 0.2 weight percent ferric chloride and 0.2 weight percent lithium acetate. The oxidative carbonylation proceeds without the necessity for incorporating a dehydrating agent in the reaction medium as is required with previous oxidative carbonylations.

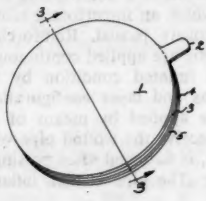
27,361
RECLOSABLE PACKAGE

Harmon B. Miller, 1095 W. Conway Drive NW., Atlanta, Ga. 30327

Original No. 3,272,422, dated Sept. 13, 1966, Ser. No. 444,271, Mar. 31, 1965. Application for reissue Mar. 6, 1970, Ser. No. 17,351

Int. Cl. B65d *43/02*

U.S. Cl. 229—43 7 Claims



The disclosure embraces a package having a reclosable lid which is releasably secured to the body of the package by a pressure sensitive adhesive; a peelable film is interposed between the package and the pressure sensitive adhesive.

PLANT PATENTS

GRANTED MAY 9, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,153
STRAWBERRY PLANT

Ruth Millay, Portland, Maine, assignor to June F. Littlefield, Lewiston, Esther Lavoie, Lisbon Falls, and Lorna A. Young, Portland, Maine, fractional part interest to each

Filed Apr. 6, 1970, Ser. No. 26,175
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—49 1 Claim

1. A new and distinct variety of strawberry plant, substantially as herein shown and described, characterized by the unique combination of a general resemblance to the "Red Rich" strawberry variety, but having a habit of producing longer, straighter, stiffer and more numerous runners ranging up to six feet in length before freezing weather, a substantially larger plant size, a more continuous everbearing habit without pause between spring and fall seasons, heavier fruit production, and a superior fruit flavor.

3,154
PLUM TREE

John M. Garabedian, 3158 Hamilton St., Fresno, Calif. 93712

Filed Apr. 15, 1970, Ser. No. 28,992
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree substantially as illustrated and described which is characterized by its vigorous growth; and its regular and heavy bearing of unusually large plums which are approximately fifty percent larger than the plums from the Kelsey plum tree (unpatented), which it most nearly resembles, but from which it is distinguished in having a dark purple skin, more nearly resembling the skin of the fruit of the Queen Ann plum tree (unpatented), having a brilliant red flesh more similar to the flesh of the fruit of the Mariposa plum tree (Patent No. 111) and in its relatively thick, tough skin which has a greater resistance to shriveling and to bruising.

3,155
AZALEA PLANT

Takeo Yuge, Altadena, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed July 13, 1970, Ser. No. 54,667
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—57 1 Claim

An improved variety of red flowered azalea plant particularly adapted for greenhouse pot-forcing characterized by its profuse production of very large, highly frilled, long lasting, bright red blossoms which are presented very upright in candle style.

3,156
POA PRATENSIS

Torao T. Fuchigami, Long Beach, Calif., and Eugene W. Mayer, Marysville, Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

Filed July 20, 1970, Ser. No. 56,757
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 1 Claim

A variety of *Poa pratensis* characterized by its excellent turf performance and disease resistance, a low growing profile, a deep blue-green color, excellent seed yield, and a favorable response to vertical growth inhibitors of the type described in U.S. Patent No. 3,462,257.

3,157
CHERRY TREE

Frederic W. Anderson, Merced, Calif., assignor to Fowler Nurseries, Inc., Newcastle, Calif.

Filed July 20, 1970, Ser. No. 56,761
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—37 1 Claim

A dense, large size, vigorous cherry tree having an upright to spreading branching habit, foliage with large ovate leaves, white bloom of medium size, and large deep-red globose fruit, uniform in size and shape, and borne regularly and heavily; the fruit—while otherwise distinct—having general similarity to the Bing (unpatented) in size, appearance, and harvest period.

3,158
PECAN TREE

William T. Osterman, Nebo, Ill., assignor to Stark Bros. Nurseries & Orchards Company, Louisiana, Mo.

Filed July 22, 1970, Ser. No. 57,374
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—31 1 Claim

1. A new and distinct variety of pecan tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a general resemblance to the variety "Starking Hardy Giant," but having heavier foliage and greater nut crop productivity, excellent hardiness to cold temperatures as low as −18° F. without injury, consistently good annual productivity of large nuts of excellent quality and good flavor, said nuts having thin shells which separate easily from the kernels, and a self fertile habit which assures good annual nut crops of good quality even in the absence of any neighboring pecan trees.

3,159
WALNUT TREE

Louis Rodbouse, Pleasant Hill, Ill., assignor to Stark Bros. Nurseries & Orchards Company, Louisiana, Mo.

Filed July 22, 1970, Ser. No. 57,375
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—32 1 Claim

1. A new and distinct variety of walnut tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a heavy nut bearing habit and consistently good annual nut crops, good hardiness to cold temperatures as low as −20° F. without injury, excellent flavor qualities of the nuts, with no bitter taste, an attractive light color of the kernels which is retained during proper storage of the nuts, and a self-fertile habit when grown in isolation from other walnut varieties.

3,160
POINSETTIA PLANT

Paul Ecke, Encinitas, Calif., assignor to Paul Ecke, Inc., Encinitas, Calif.

Filed July 24, 1970, Ser. No. 58,210
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a short-growing and compact plant habit, a uniform and fast rooting habit, a self-branching habit resulting in the

production of multiple blooms without pinching off the terminal buds as required for other poinsettia varieties, attractive green foliage which is usually somewhat darker green in color than the foliage of "Annette Hegg," with the leaves having distinctive petioles of red color on both the upper and lower surfaces thereof, attractive, darker red bracts than the normal red bracts of "Annette Hegg," said dark red bracts having less tendency to droop than the bracts of "Annette Hegg" when the plants reach maturity, and the darker red color of the bracts being more stable and retaining its brilliance much longer when the plants are used for home decoration, and long-lasting plant qualities.

3,161
ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Aug. 24, 1970, Ser. No. 66,663
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by buds and flowers resembling the Eleanor rose (miniature—United States Plant Patent No. 2,175) in general shape and size but differing in color, the general color effect of the opening bud and freshly opened flower being a bright shade of orange-red; and further characterized by a plant of compact growth but more vigorous than the Eleanor variety, easy to propagate from cuttings, with medium small semi-glossy foliage, an abundance of bloom borne almost continuously throughout the growing season, with flowers borne singly or in loose candelabra clusters.

3,162
ROSE PLANT
Walter E. Lammerts, Freedom, Calif., assignor to Germain's Inc., Los Angeles, Calif.
Filed Sept. 25, 1970, Ser. No. 75,794
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—22 **1 Claim**

A new floribunda variety of rose plant particularly characterized by the very clear and uniform red margin extending completely around each petal, except for the base, which in the opening stage of the bloom contrasts sharply with the basic ivory color of the rest of the petal. The new plant is a free producing variety and under greenhouse conditions produces blooms throughout the entire year that have excellent lasting quality as cut flowers.

3,163
ROSE PLANT
Herbert C. Swim and O. L. Weeks, Ontario, Calif., assignors to The Conard-Pyle Company, West Grove, Pa.
Filed Sept. 29, 1970, Ser. No. 76,650
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a healthy and vigorous plant habit, long and strong cutting stems which give good support to the blooms, abundant foliage of excellent quality and having better than average disease resistance, a free blooming habit which results in good garden color almost constantly during its normal blooming season, excellent flower petal substance, with consequent good qualities for cut flowers, as well as for garden and landscape use, and an attractive and distinctive fiery orange-red flower color which intensifies in its luminescence in hot weather.

3,164
PLUM TREE
John M. Garabedian, 3158 Hamilton St., Fresno, Calif. 93712
Filed Oct. 19, 1970, Ser. No. 82,228
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—38 **1 Claim**

A plum tree of medium to small size, medium vigor, upright, open, vase-formed, hardy, and a regular and productive bearer of uniform, large to medium size, usually semi-freestone fruit having red skin and red flesh.

3,165
NECTARINE TREE
Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.
Filed Oct. 29, 1970, Ser. No. 85,313
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 **1 Claim**

A variety of nectarine tree which is large, vigorous, spreading, open, and a regular and very productive bearer of medium size, globose to oblong, freestone fruit, of good keeping and shipping quality, which is uniform both as to size and form; the fruit—which is characterized by an unusually long harvest period—having yellow flesh with red at the pit cavity, and skin which is entirely overspread with high red at maturity.

3,166
YELLOW ROSE
Robert G. Jelly, Richmond, Ind., assignor to E. G. Hill Co., Inc., Richmond, Ind.
Filed Oct. 24, 1969, Ser. No. 869,402
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—24 **1 Claim**

A continuous and free blooming variety of floribunda rose plant for greenhouse culture, characterized by the very stable yellow color of its blooms, its vigorous and upright growth habit, and its improved winter productivity under low light intensities.

3,167
HYBRID TEA ROSE
Robert G. Jelly, Richmond, Ind., assignor to E. G. Hill Co., Inc., Richmond, Ind.
Filed Oct. 24, 1969, Ser. No. 869,403
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—14 **1 Claim**

A new variety of hybrid tea rose plant developed for greenhouse production of cut flowers by cross with Snowsong Supreme (P.P. 2,624) and distinguished by longer stems for its blooms, the lively white color of the blooms, and the ability of the flowers to withstand handling and shipping without bruising.

PATENTS

GRANTED MAY 9, 1972

GENERAL AND MECHANICAL

3,660,849

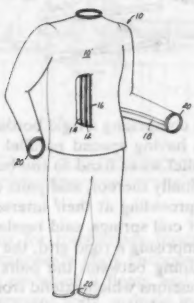
DEEP SUBMERGENCE DIVING SUIT AND INSULATIVE MATERIAL THEREFOR

Nelson Jonnes, Stillwater, Minn., and William S. Friedlander, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application Ser. No. 701,421, Jan. 29, 1968, now abandoned. This application July 13, 1970, Ser. No. 54,163

Int. Cl. B32b *3/26;* **B63c** *11/04;* **B32b** *5/16*

U.S. Cl. 2—2.1 **20 Claims**



Deep submergence diving suit which maintains its low thermal conductivity at great depths and provides constant buoyancy at changing depths, having a layer of thixotropic material such as a grease or very low modulus elastomeric material filled with hollow glass microbubbles as an insulating layer, the preferred construction being based on a gel of block copolymer and mineral oil as the low modulus matrix.

3,660,850

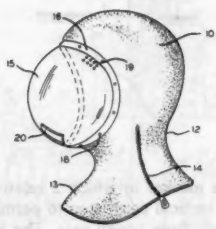
PROTECTIVE HOOD FOR CRASH HELMETS

Walter E. Garbisch, 4215 W. Hawthorne Trace, Brown Deer, Wis.

Filed Mar. 27, 1970, Ser. No. 23,209

Int. Cl. A41c *13/00*

U.S. Cl. 2—2 **7 Claims**



A hood fits over a crash-helmet, the neck, and part of the shoulders of a person wearing the helmet. A transparent, double-walled face shield attached to the hood protects the wearer of the crash-helmet.

3,660,851

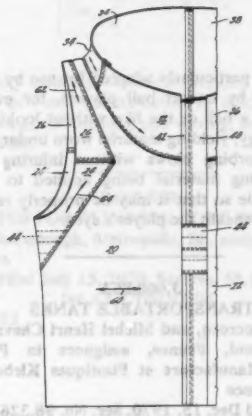
RESTRAINT TORSO FOR A PRESSURIZED SUIT

Michael A. Marroni, Jr., Westogue, Conn., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 20, 1968, Ser. No. 785,613

Int. Cl. A62b *17/00;* **A41b** *1/00*

U.S. Cl. 2—2.1 **1 Claim**

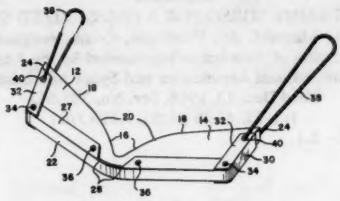


A restraint torso for a pressurized suit consists solely of restraint cloth (with the exception of a zipper for frontal closure not disclosed herein). The torso is rendered elliptical and flat across the chest, rather than cylindrical, by means of shoulder transitions pieces, an upper piece extending from the front of the armhole over the shoulder to the rear of the armhole, and a lower piece extending from the front of the armhole under the arm to the rear of the armhole. The pattern of the lower piece includes slightly curved edges which form straight seams with the main torso pieces, and is cut with the warp oriented so as to provide, in the torso, a warp which extends curvilinearly from below the arm upwardly and inwardly toward the neck at the front of the suit, and with the warp providing virtual extension of the frontal warp direction at the rear of the suit (from the arm downwardly toward the center of the back). The upper piece is so cut that its warp runs from front to back directly over the shoulder. These pieces, together with seams which are five layers thick, and therefore provide restraint against stretching, cause the torso to distort when under pressure into the aforementioned generally elliptical shape, with the chest being relatively flat across the front between the arms. Collar transitions are provided so that the front center of the suit is substantially a straight line from the chin to the waist, thereby to accommodate a reliable closure, such as a zipper with a seal. A restraint belt is provided from under one arm around the back to the under side of the other arm. The main torso pieces in the front are double layers of cloth whereas the main torso pieces in the rear are single layers of cloth. This factor, together with the restraint belt at the back, causes the torso, when under pressure, to remain relatively flat across the chest, while allowing a certain amount of ballooning in the upper back. Precise cloth patterns are disclosed.

3,660,852
EYE SHADE

Leonard Schulenberg, Mound City, Mo.

Substitute for application Ser. No. 563,109, July 6, 1966, now abandoned. This application Aug. 7, 1970, Ser. No. 62,050
Int. Cl. A61f 9/00
U.S. Cl. 2—12 4 Claims

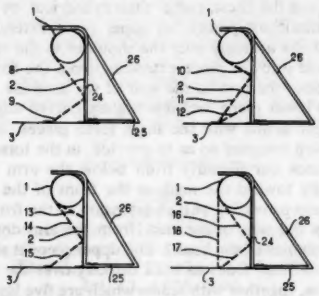


An eye shade particularly adapted for use by athletes during training, as by basket ball players, for practicing the manipulation of a ball or the like without looking at it. The shade is of spongy, yielding material worn under the eyes and capable of absorbing blows without injuring the player, resilient, stiffening material being applied to the forward edge of the shade so that it may be properly retained in its position of use beneath the player's eyes.

3,660,853
TRANSPORTABLE TANKS

Roger Eugene Ducrocq, and Michel Henri Chevalier, both of Lermont-Ferrand, France, assignors to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Filed Dec. 15, 1970, Ser. No. 98,326
Claims priority, application France, Dec. 16, 1969, 6943628
Int. Cl. E04h 3/18, 3/16
U.S. Cl. 4—172.19 9 Claims

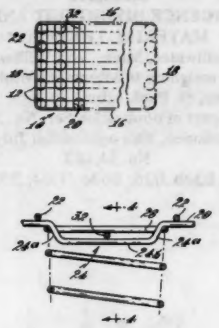


This invention relates to transportable tanks that comprise a base, a wall and one or more inflatable tubes that form part of the wall. The invention is concerned with making the inflatable tube support the wall in a more efficient manner than hitherto and also to form the tank into a polygonal shape, such as a rectangle. The tubular member is reinforced or supported by flexible members which are so located and relatively crossed that the tube acts as a float when the tank is filled with water and thus maintains the polygonal shape of the tank. Additional supports may be used along the sides of the tank and the corners are supported differently from the rectilinear parts. Such a tank may be used as a transportable swimming pool.

3,660,854
SPRING ASSEMBLY AND METHOD OF MAKING THE SAME

Harry A. Garceau, Charlton City, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed May 18, 1970, Ser. No. 38,266
Int. Cl. A47c 23/04, 25/00
U.S. Cl. 5—267 7 Claims

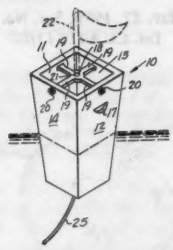


A spring structure comprising a rigid border wire rectangular in configuration having spaced parallel ends and sides, spaced pairs of parallel wires fixed to the border wire transversely and longitudinally thereof, said pairs of wires crossing at right angles and providing at their intersections end supports for the ends of coil springs, said border wire and pairs of crossing wires comprising a rigid grid, the pairs of wires in one direction containing between the pairs of wires in the other direction depressions which extend from the lower side of the grid, a plurality of coil springs mounted to the lower side of the grid with their axes perpendicular thereto and with their ends engaged with the grid and with said depressed portions of the wires, and locking wires extending from border wire to border wire of the grid between the ends of the coils and said depressed portions of the wires in directions at right angles to the wires containing the depressions.

3,660,855
FLOATING MARINE MARKER

Clarence D. Inman, 107 Pine Drive, Covington, La.

Filed Dec. 4, 1970, Ser. No. 95,040
Int. Cl. B63b 21/52
U.S. Cl. 9—8 R 6 Claims



A floating marine marker in which a relatively thin wall surrounds a central vertical open area to permit the passage of water therethrough from rough seas. The relatively thin wall is divided into a plurality of water tight compartments which may be filled with flotation foam if desired. In the modified form of the invention the wall is formed of flotation foam coated with plastic to prevent disintegration of the wall. A flexible removable plastic spider having a central vertical bore is mounted in the top of the marker and is adapted to support a flag pole or like. A bar is embedded in the lower end of the marker for attaching anchor lines thereto. The bar

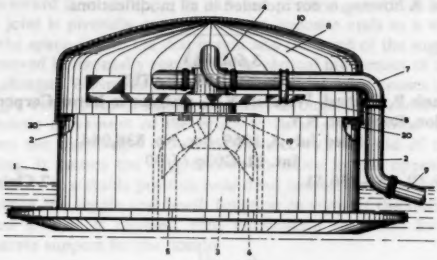
has a central notch for supporting the flag pole. The marker has downwardly sloping tapered walls and may be generally rectangular in horizontal cross-section, triangular in horizontal cross-section, hexangular, circular, oval, or any other desired cross-sectional shape.

3,660,856

MOORING BUOY

Robert Smulders, Meer, Belgium, assignor to Single-Buoy Mooring, Inc., Zuz, Switzerland

Filed Oct. 9, 1969, Ser. No. 865,153
Claims priority, application Netherlands, Oct. 10, 1968, 6814522
Int. Cl. B63b *21/50, 21/00*
U.S. Cl. 9—8 P 5 Claims



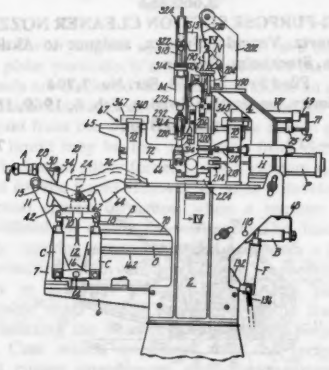
A mooring buoy for transferring fluids between a vessel and the shore comprises a buoy anchored to the bottom of the body of water on which it floats, and a turntable carried by the buoy. To prevent icing, a shield in the form of an inverted bowl is carried by the turntable and is heated, either electrically or by a fluid such as sea water, closed circuit fresh water, or the handled fluid itself. The buoy is also heated adjacent the rim of the cover and adjacent the turntable bearings.

3,660,857

AUTOMATICALLY LASTING MACHINES

Jeremy C. Heal; Raymond Snape, both of Leicester, Leicestershire, and Philip B. Gower, Skipton, Yorkshire, all of England, assignors to USM Corporation, Boston, Mass.

Original application Feb. 17, 1969, Ser. No. 799,856. Divided and this application June 1, 1970, Ser. No. 54,062
Int. Cl. A43d *3/00*
U.S. Cl. 12—127 7 Claims



A shoe lasting machine having a support automatically orienting shoes with lasting devices which include grippers automatically located at opposite sides of each shoe and adapted to pull the upper predetermined amounts depending on whether the shoe is left or right.

3,660,858

CAR BEAUTY CARE CENTER

Orville S. Smith, Jr., Columbia, S.C., assignor to Conston, Inc., Columbia, S.C.

Filed June 1, 1970, Ser. No. 41,868
Int. Cl. B60s *3/00*
U.S. Cl. 15—1 9 Claims

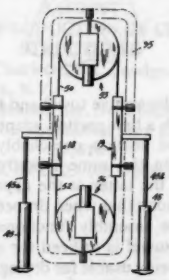
A car beauty center providing a plurality of optional services for the care and beautification of automotive vehicles including fueling, car washing and waxing, as well as custom interior, facilities.

3,660,859

APPARATUS FOR CLEANING COKE OVEN JAMBS

Charles D. McCullough, Metropolis, Ill., assignor to Wilputte Corporation

Filed July 15, 1970, Ser. No. 55,163
Int. Cl. C10b *43/04*
U.S. Cl. 15—93 7 Claims



Apparatus for scraping coke oven jambs clean of carbontar substances formed thereon during a coking operation. The apparatus includes a pair of carriages having a plurality of scraper units thereon for scraping the side walls of the jamb, and upper and lower oscillating scraping mechanisms operating in timed relationship with said carriages, the oscillating scraping mechanisms scraping the top and bottom walls, respectively, and the corner portions contiguous therewith.

3,660,860

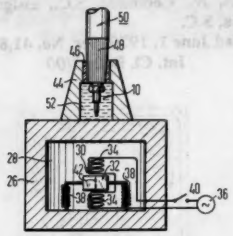
VIBRATION DEVICE

Peter Dziuk, Nurnberg, Germany, assignor to J. S. Staedtler, Nurnberg, Germany

Filed Apr. 1, 1970, Ser. No. 24,637
Claims priority, application Germany, Aug. 25, 1969, P 19 43 199.3
Int. Cl. B08b *7/02*; B06b *1/00*
U.S. Cl. 15—94 5 Claims

A cleaning device for fountain pens having tubular nibs has a vibrator mounted in a housing on which a coupling device

for coupling to the pen to be cleaned is fixedly fastened. The



direction of oscillation of the vibrator is aligned with the bore of the tubular nib of a coupled pen.

3,660,861

COMBINATION ROUND TOWEL AND HOLDER

Edward N. Delmonico, 1546 Bruce St., North Vancouver, British Columbia, Canada

Filed Jan. 6, 1970, Ser. No. 1,016

Claims priority, application Canada, Jan. 10, 1969, 039,777

Int. Cl. A47k *10/12*

U.S. Cl. 15—209 R **4 Claims**

A functional and decorative towel and hanger assembly including a hanger with a first portion adapted to be secured to a wall and a second portion detachably connectable to a towel for suspending the same therefrom, and a circular towel connected to the latter at the approximate geometric center of the towel such that when draped, it provides a neat appearing decorative assembly functional for use in that a minimal amount of towel is utilized for anchoring the same with the remainder being usable for drying hands.

3,660,862

WIPER ARM

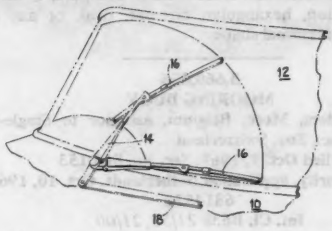
Anthony C. Scinta, Hamburg, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Apr. 24, 1970, Ser. No. 31,492

Int. Cl. B60s *1/40*

U.S. Cl. 15—250.23 **8 Claims**

A blade supporting arm connector for releasably attaching a wiper blade to a wiper arm is pivotally secured to the free end of the wiper arm about an axis perpendicular to an associated windshield and is spring urged by a torsion spring, a tension spring, or a hairpin type spring to pivot relative to the longitudinal axis of the arm assembly to a position where it presents the blade with the longitudinal axis of the blade angularly displaced from the longitudinal axis of the arm. The blade connector may be a cantilever pin type element for releasably engaging a receptor in a blade superstructure or a bayonet type element for reception in a bayonet clip. In certain modifications a housing, sector shaped in lateral cross section, lined with anti-friction sheet material, is secured to the end of the arm and encloses the end of the blade connector. A cushioning element may be disposed on each side of the enclosed portion of the arm connector. In other modifications a similar housing is secured to the inner end of the



blade supporting connector and encloses the free end of the arm. A housing is not included in all modifications.

3,660,863

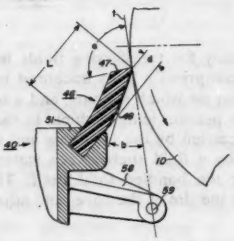
CLEANING APPARATUS

Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 3, 1969, Ser. No. 838,984

Int. Cl. G03g *15/00*

U.S. Cl. 15—256.51 **7 Claims**



An elastomeric blade is herein disclosed for removing a dry particulate material from a surface to which the particulate material is electrostatically bonded. An edge of the blade is supported in pressure contact against the surface in a cutting tool fashion and relative motion between the blade and the surface produced wherein the edge of the blade moves between the particulate material and the surface to cut or chisel the material from the surface.

3,660,864

MULTI-PURPOSE SUCTION CLEANER NOZZLE

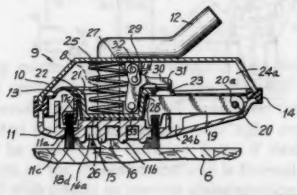
Osten Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 2, 1970, Ser. No. 7,704

Claims priority, application Sweden, Feb. 6, 1969, 1562/69

Int. Cl. A47l *9/06*

U.S. Cl. 15—319 **7 Claims**



This invention relates to a multi-purpose suction cleaner nozzle having a suction inlet which is movable over a rug to

remove dirt therefrom. A brush for removing dirt from a floor is mounted on a diaphragm for movement between upper and lower positions at the vicinity of the suction inlet, the diaphragm forming a wall of a space in communication with a passageway leading to the suction inlet and in which a partial vacuum is developed during operation of the nozzle.

A spring acting on the diaphragm tends to bias the brush to its lower position below the suction inlet responsive to a first partial vacuum developed in the space when a floor is cleaned by the nozzle and the air flow therethrough exceeds a predetermined speed. A second higher partial vacuum is developed in the space when a rug is cleaned by the nozzle and the air flow therethrough is at or less than the predetermined speed, such higher vacuum overcoming the biasing action of the spring and moving the brush to its upper position at or above the suction inlet.

In order to insure that the brush will always move downward from its upper to its lower position, a vertical toggle joint is pivotally connected at its opposite ends to a wall of the space and to the diaphragm and the bend of the toggle is moved horizontally responsive to vertical movement of the diaphragm. When the diaphragm moves upward it causes the toggle bend to move in one direction through dead center to promote movement of the brush to its upper position; and when the diaphragm moves downward with the aid of the spring, it causes the toggle bend to move in the opposite direction to a stable position near dead center. At such stable position the toggle and brush function to support the nozzle when a floor is cleaned, thus eliminating the need for a separate support for the nozzle.

3,660,865

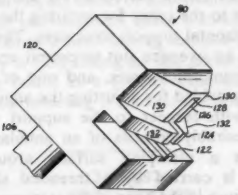
APPARATUS FOR THE MANUFACTURE OF COLOR CATHODE RAY TUBE SCREENS

John F. Larson, Seneca Falls, N.Y., and Walter A. Polashenski, Roanoke, Va., assignors to Sylvania Electric Products, Inc.

Original application Apr. 22, 1968, Ser. No. 723,098. Divided and this application Sept. 24, 1970, Ser. No. 75,103

Int. Cl. A47d *9/02*

U.S. Cl. 15—415 **2 Claims**



Methods for drying the upstanding walls of a cathode ray tube face plate, particularly around the area of the mask supporting studs are disclosed. The methods utilize an accurately controlled and automatically positionable head for removing excess liquid from the walls and stud area after a processing step. The liquid may be that remaining from either a prerinse in which case either forced air or a vacuum system may be utilized for the liquid removal; or after a developing step in the actual screen formation when a vacuum principle alone is utilized for drying the wall area. The described apparatus for carrying out the methods comprises a free-floating, self-orienting head which is pivoted to provide arcuate movement in a given substantially vertical plane, and reciprocatable shaft means connected to the free-floating head for indexing the head in a substantially perpendicular direction. Cam means associated with the reciprocatable movement causes engagement and disengagement of the head with the face plate in accordance with the direction of movement thereof. The cam means causes the head to pivot in a substantially horizontal plane to bring the head into engagement with the face plate wall.

3,660,866

APPARATUS FOR OPENING BALES OF TEXTILE FIBERS

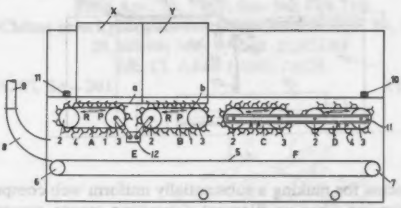
Peter Jagst, Rheydt, Germany, assignor to Truetzschler & Co., Rheydt, Germany

Filed Jan. 19, 1970, Ser. No. 3,680

Claims priority, application Germany, Jan. 22, 1969, P 19 02 951.7

Int. Cl. D01g *7/06*

U.S. Cl. 19—81 **6 Claims**



Improved textile fiber bale opening apparatus having a multiplicity of conveyor belts each of which is supported by two spaced rollers and is rotatable about the rollers in both, opposite directions; outwardly directed needle means on the surface of the conveyor belts adapted to penetrate a bale resting thereon; motive means to drive the conveyor belts; and control means at opposite ends of the total conveyor belt path operatively connected to the drive means, and operative in response to a bale reaching this path end, adapted to reverse the drive direction.

3,660,867

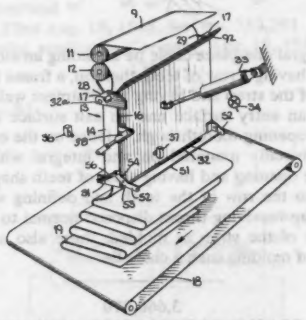
METHOD FOR PRODUCTION OF CROSS-LAPPED STRUCTURES

George A. Watson, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Continuation of application Ser. No. 568,877, July 29, 1966, now abandoned. This application May 13, 1970, Ser. No. 37,416

Int. Cl. D01g *25/00*; D04h *3/02*

U.S. Cl. 19—163 **3 Claims**



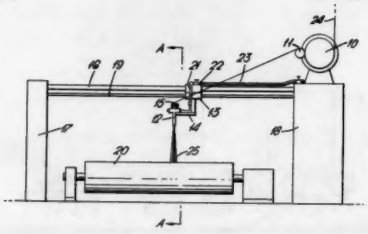
A method for producing cross lapped structures such as battings from lightweight continuous filament webs utilizing high speed delivery means wherein the lightweight web is traversed across a moving collection means utilizing air currents to aid in the traversal, thereby producing a cross lapped structure.

3,660,868

MANUFACTURE OF NON-WOVEN FIBROUS WEBS

Clive Harry Weightman, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 19, 1969, Ser. No. 825,841
Claims priority, application Great Britain, May 29, 1968, 25,776/68; Oct. 4, 1968, 47,223/68
Int. Cl. D04h 11/04
U.S. Cl. 19—163 2 Claims



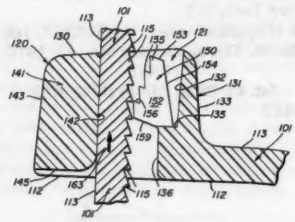
A process for making a substantially uniform web comprising traversing fiber or filament depositing means across a moving conveyor under conditions defined by the formula $y = 2x(t+z)$ where y is the total effective width of web deposited by the fiber or filament depositing means measured in the direction of travel of the conveyor, x is the speed of the conveyor, t is the turn round time of the fiber or filament depositing means, x is the traverse time of the fiber or filament depositing means and n is any whole number.

3,660,869

ONE-PIECE CABLE TIE

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, both of Ill., assignors to Pandult Corp., Tinley Park, Ill.

Filed May 1, 1969, Ser. No. 828,075
Int. Cl. B65d 63/00
U.S. Cl. 24—16 PB 14 Claims



An integral one-piece cable tie including an elongated flexible strap having a row of teeth thereon, a frame integral with one end of the strap and having an abutment wall and an end wall and an entry surface and an exit surface and a strap-receiving opening therethrough, a ledge on the end wall, and a pawl pivotally mounted on and integral with the ledge within the opening and having a set of teeth shaped complementary to the row of the teeth and defining with the end wall a strap-receiving throat disposed normal to the longitudinal axis of the strap as molded; there also are disclosed methods of molding such a cable tie.

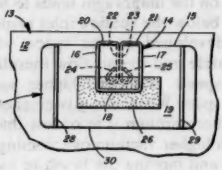
3,660,870

STATIONERY FASTENER ASSEMBLY

Harold F. Murphy, 46 Monmouth Parkway, Monmouth Beach, N.J.

Filed Dec. 9, 1970, Ser. No. 96,551
Int. Cl. B42f 1/00
U.S. Cl. 24—67 R 7 Claims

A stationery fastener assembly attachable to a folder or other stationery carrier comprising a backing sheet attached to the folder or carrier and a resilient clip attached to the top edge of the backing sheet, the clip having a front portion overlying the face of the backing sheet characterized by a pair of generally parallel, spaced apart legs extending downwardly from the top of the sheet and connected at their



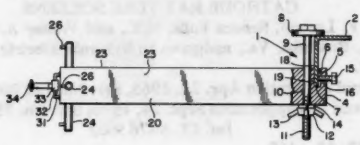
opposite ends by an integral spacing leg, the rear portion of the clip comprising a pair of legs extending downwardly from the top edge of the backing sheet, the front portion of the clip being resiliently engaged to the front face of the backing sheet, and a frictional surface on the face of the backing sheet in close proximity to the front portion of the clip.

3,660,871

UNIVERSAL BEAM CLAMP

William Joseph Boyle, Jr., New Orleans, La., assignor to Delta Marine Contr. Division of Unitec Industries, Inc., Baltimore (Cockeysville), Md.

Filed Aug. 26, 1970, Ser. No. 67,048
Int. Cl. A44b 21/00
U.S. Cl. 24—73 R 10 Claims



Universal beam clamp includes two clamping jaws, one movable relative to the other for securing the clamp to both vertical and horizontal support structures. The relatively stationary jaw has an oversize slot to permit engagement with flanges of different thicknesses, and one or more leveling screws may be provided for adjusting the angular orientation of the clamp with respect to the support structure. The movable jaw desirably consists of an annular disc or plate which provides a clamping surface around its entire periphery and is carried by a threaded shaft extending through an aperture in the base of the stationary jaw adjacent the slot therein for movement toward and away from the stationary jaw upon tightening and loosening of a nut threaded onto the other end of the shaft. The load may be directly supported by the clamp or suspended therefrom, and a handrail mount may be provided on each side of the clamp to permit support of a handrail in any position of the clamp.

3,660,872

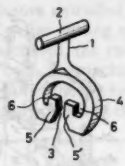
FASTENERS FOR ATTACHING CLOTHES TO RIBS OF UMBRELLAS

Takuo Kawano, Kyoto, Japan, assignor to Moon Bat Kabushiki Kaisha, Kyoto, Japan

Filed Sept. 28, 1970, Ser. No. 75,936
Claims priority, application Japan, Dec. 26, 1969, 45/1549
Int. Cl. A44b 21/00; A45b 25/18
U.S. Cl. 24—75 PF 4 Claims

A fastener for attaching the cloth to the ribs of a umbrella is made of deformable material and comprises a neck, a transverse rod integrally connected to one end of the neck and a substantially inverted U-shaped anchor connected to

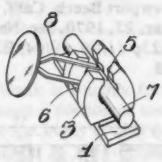
the other end of the neck. The outer ends of the legs of the anchor are folded back inwardly to form grooves to receive the rib.



3,660,873
JEWELRY HOLDING DEVICE

Mitsuo Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daiichi Keisu Seisakusho, Tokyo, Japan

Filed July 1, 1970, Ser. No. 51,611
Int. Cl. B65d *1/34*; A44b *21/00*
U.S. Cl. 24—81 CR 6 Claims



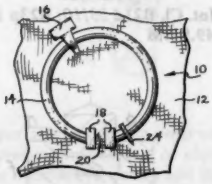
This invention discloses a jewelry holding device which comprises a plurality of holding projections projecting from and formed integrally with a base plate, said holding projections and base plate being made of a comparatively elastic material, thereby enabling a piece of jewelry to be securely and pivotally held in the grooves formed between said projections. Thereby, the jewelry such as a cuff link, tie holder, ring etc. can be held rotatably so as to lie down for transportation and safe-keeping and to set up at a desired angle, thus heightening the display effect of the commodity.

In one of the embodiments, there is formed, between said holding projections a neck having stepped portions on both sides, whereby a firm fitting of the jewelry holding device into a setting board in a jewelry case can be easily and rapidly done by inserting it into an opening formed in said setting board.

3,660,874
PIN FASTENER

Marden G. Platt, 319 Willett Avenue, Riverside, R.I.

Filed Feb. 24, 1970, Ser. No. 13,693
Int. Cl. A44c *1/00*
U.S. Cl. 24—162 5 Claims

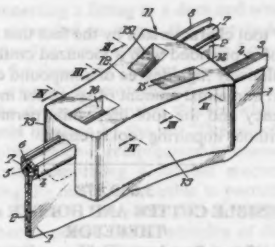


A pin fastener which utilizes both sliding and rotational movement of a pin element to close and open the fastener. The preferred embodiment comprises a generally circular elongated pin supporting member having raised, spaced end portions which form a pin receiving opening through which the pin portion of the fastener can be rotated. The pin element itself is mounted on the support member in a manner to permit both sliding movement along and rotational movement about the longitudinal axis of the pin supporting member. The closing and opening operations are both accomplished by moving the pin element through a rotational-sliding-rotational sequence.

3,660,875
SLIDER FOR SLIDING CLASP FASTENER

Isaj Gutman, Harrow, England, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Apr. 28, 1969, Ser. No. 819,710
Claims priority, application Great Britain, Apr. 29, 1968, 20,200/68; May 9, 1968, 22,074/68
Int. Cl. A44b *19/00*, *19/26*
U.S. Cl. 24—201 11 Claims

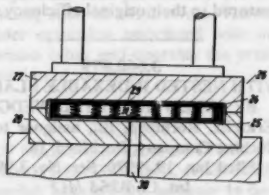


The slider comprises a single slider plate, a side wall at each side of the slide plate, and a separating member between the side walls so as to form a substantially Y-shaped channel for receiving interlocking members of the fastener. The slider plate has three windows, unobstructed from the outside; two of the windows communicate with the arms of the Y-shaped channel, and the third communicates with the stem. Projections are provided on the separating member and on the side walls for guiding the interlocking members through the arms and through the stem, respectively, of the Y-shaped channel.

3,660,876
METHOD OF MAKING AN UPHOLSTERED BODY

Philipp Krier, Stuttgart-Schonberg, and Lothar Fendler, Stuttgart, both of Germany, assignors to Mirabed AG., Zug, Switzerland

Filed Aug. 19, 1968, Ser. No. 753,391
Claims priority, application Germany, Aug. 19, 1967, P 16 85 176.6
Int. Cl. B68g *7/00*
U.S. Cl. 29—91 5 Claims



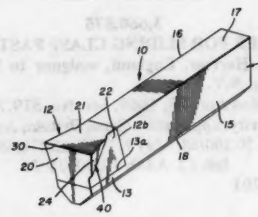
An upholstered body, especially mattress and seat for automobiles, and method of making the same, according to which a core body of coil springs has a seamless cover of foamed material, for instance, of polyester, or polyether, around said core body.

3,660,877

CUTOFF TOOL HAVING IMPROVED CUTTING TIP

William B. Stein, Barberton, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Apr. 22, 1970, Ser. No. 30,682
Int. Cl. B26d 1/00
U.S. Cl. 29—95 7 Claims



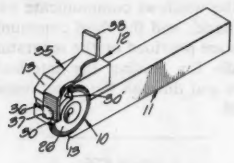
A cutoff tool characterized by the fact that the cutting portion thereof is provided with a localized cutting area that includes a relatively high degree of compound clearance angles provided in a minimal amount of space for increasing the cutoff efficiency and the tool life, while permitting simplified grinding without impairing tool strength.

3,660,878

REVERSIBLE CUTTER AND HOLDER ASSEMBLY THEREFOR

James E. White, Pasadena, Calif., assignor to Poly-Mech Products, Incorporated, Pasadena, Calif.

Filed Jan. 7, 1970, Ser. No. 1,214
Int. Cl. B26d 1/00
U.S. Cl. 29—98 4 Claims



A machine tool cutter and holder assembly therefor, the cutter having a circular head deeply notched to provide a pair of identical cutting edges usable alternatively at the user's option simply by inverting the cutter in the mounting assembly to bring a selected cutting edge into cutting position. The clamping jaw of the holder assembly includes a fulcrum rendering the jaw self-centering with respect to the cutter shank and the seating recess therefor provided in the fixed main holder member. The cutting edges can be resharpened and restored to their original efficiency repeatedly.

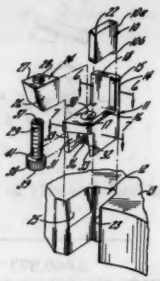
3,660,879

CUTTER WITH NESTED INDEXABLE BLADE CLAMPED BY SCREW ACTUATED WEDGE

Donald S. Erkfritz, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Jan. 19, 1970, Ser. No. 3,990
Int. Cl. B26d 1/12
U.S. Cl. 29—105 6 Claims

In the disclosed milling cutter, an indexable insert is seated in a nest in one end of a separately formed holder tack welded at opposite ends to edges of the body slot. A wedge, clamping the insert against a wall of the slot, is drawn into the latter by a screw threaded into the wedge and extending along the slot through a hole in a crosspiece of the holder engaged by the underside of the screw head during the tightening. Two tack welds at the inner end of the holder are located so as to be stressed in shear as a result of the screw tightening.

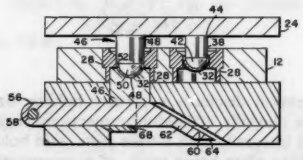


3,660,880

HOLLOW BEARING BALL AND PROCESS FOR MAKING THEM

Edward R. Glenn, Newport Beach, Calif.

Filed Mar. 27, 1970, Ser. No. 23,218
Int. Cl. B23p 11/00, 19/04; B21d 39/02
U.S. Cl. 29—148.4 B 11 Claims



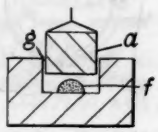
A hollow bearing ball formed from a relatively resilient steel by initially stamping a round blank from a strip, drawing the blank, and forging and flowing the drawn blank of metal to subsequently form a substantially hemispherical portion of a hollow bearing ball. The hemispherical portions are fed into a hopper which serve to place them in opposed concave relationship after which they are interposed within and between two electrode welding seats which hold the hemispherical portions under pressure and weld them to form a hollow bearing ball.

3,660,881

METHOD OF MAKING A BEARING

Derek G. Viner, and John S. Thompson, both of Ilford, England, assignors to The Plessey Company Limited, Ilford, England

Original application Aug. 12, 1968, Ser. No. 752,053, now Patent No. 3,545,900, dated Aug., 1967. Divided and this application Sept. 15, 1970, Ser. No. 72,299
Claims priority, application Great Britain, Sept. 2, 1967, 40,211/67
Int. Cl. B21d 53/10; B23p 11/00
U.S. Cl. 29—149.5 NM 2 Claims



A carbon-lined journal bearing is manufactured by forcing a solid carbon plug into a socket bore of a metal body after

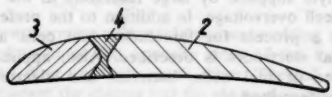
introducing a quantity of adhesive into the closed end of the socket bore. The bore allows clearance round the plug so that the adhesive becomes extruded through the gap to fill the latter completely. After setting of the adhesive the two end surfaces are re-machined, the carbon plug is bored conversion into a carbon liner, the machining of the end face adjacent to the closed end of the socket bore being continued to remove the closed end portion of the latter.

3,660,882

PROCESS FOR THE PRODUCTION OF TURBINE BLADES

Herbert Widowitz, Kapfenberg, and Manfred Hammer, Bruck S.D. Mur, both of Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Kapfenberg, Austria

Filed Apr. 27, 1970, Ser. No. 32,037
Claims priority, application Austria, Apr. 28, 1969, 4074/69
Int. Cl. B21k *3/04*; B23p *15/02, 15/00*
U.S. Cl. 29—156.8 B **4 Claims**



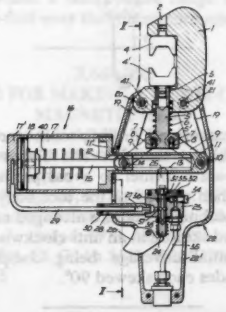
A turbine blade blank is roughly formed having a recess extending along at least a portion of the leading edge, and a hard alloy leading edge insert is also roughly formed to be commensurate in shape to the recess. The insert is then welded to the blade blank, the composite blade is then forged into final shape and heat treated.

3,660,883

PORTABLE PRESS

Max Hoeckele, Steinach, Germany, assignor to Karl Pfisterer Fabrik elektrotechnischer Spezialartikel, Stuttgart-Unterturkheim, Germany

Filed Mar. 4, 1970, Ser. No. 16,462
Claims priority, application Germany, Feb. 18, 1970, P 19 12 908.9
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 DT **13 Claims**



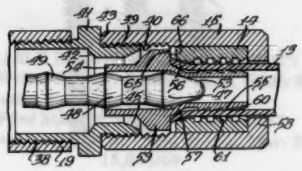
An inexpensive portable pneumatic press which is intended primarily for compressing mechanical or electric connecting elements of electric conductors, cables and the like, in which a ram is driven by one or two cylinder-and-piston units extending transverse to the ram by means of at least one pair of toggle arms which are moved with an equal force toward each other. When the ram approaches its final compressing position, the toggle arm acts upon a control member which shifts the control valve to its venting position.

3,660,884

HAND TOOL FOR CONNECTING A FITTING TO A DUCT END

Leonard J. Kowal, Prospect Heights, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed Nov. 14, 1969, Ser. No. 876,942
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 **11 Claims**



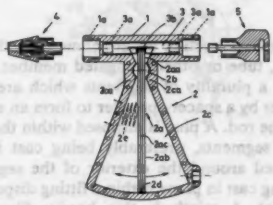
A tool for connecting a fitting to a duct end wherein an insert is radially expanded to clamp the duct end against an outer shell received in a nut member of the fitting. The tool includes means for threading the nut member onto one end of the tool and a punch for movement axially through the insert to effect the desired expansion thereof while the insert and shell are held in place by the nut. The punch is carried on a force member which is reciprocated by manually operable means herein comprising a ratchet mechanism. The means for holding the nut is replaceable to permit a substitution of different size nuts. The punch is removably secured to the force member to permit the substitution of different size punches. Thus, different size fittings may be readily made up with the tool.

3,660,885

PRESSURE-OPERATED TOOL

Lorenz Elflein, Rhonstrasse 66, 874 Bad Neustadt, Saale, Germany

Filed Mar. 6, 1970, Ser. No. 17,115
Claims priority, application Germany, Apr. 21, 1969, P 19 20 191.3
Int. Cl. B23p *11/00*
U.S. Cl. 29—243.53 **9 Claims**



A pressure-operated tool particularly for the setting of fastening elements, such as blind rivets. The tool utilizes a pressure cylinder operation associated with one end of a pivotal lever whose other end operates the pressing or draw unit for axial motion of the latter.

3,660,886

METHOD OF MAKING FIRING SETTERS FOR TILES AND OTHER CERAMIC ARTICLES

Emanuele Albertini, Milan, Italy, assignor to Societa Ceramica Italiana Richard-Ginori S.p.A., Milan, Italy

Filed Jan. 20, 1970, Ser. No. 4,224
Claims priority, application Italy, Feb. 20, 1969, 13099/69
Int. Cl. B23p *19/00, 21/00*
U.S. Cl. 29—434 **6 Claims**

A method of forming cell-shaped assemblies of firing setters for individually and spacably supporting a plurality of

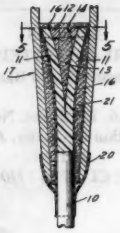
tiles and other ceramic ware during the firing of the glaze in a firing kiln which involves providing upright wall components made of refractory material with laterally extending projections for supporting the tiles, further providing transverse or horizontal components, also formed of ceramic material, with complimentary configurations for interengaging transverse components in a co-planar manner and interlinking the top and bottom ends of the upright components with the edge portions of the transverse components for affording an essentially loose interfitting engagement of the components to provide an assembly made of a plurality of superimposed and side-by-side located cells.

3,660,887

METHOD FOR CONNECTING ATTACHMENTS TO FIBER GLASS RODS

Elbert Davis, Los Angeles, Calif., assignor to Nupla Corporation, Sun Valley, Calif.

Filed June 20, 1969, Ser. No. 835,135
Int. Cl. B23p *3/00, 19/04*
U.S. Cl. 29—460 **9 Claims**



A method for connecting an attachment to the end of a fiber glass rod, tube or other elongated member. The rod is separated into a plurality of segments which are held apart from each other by a spacer-spreader to form an enlargement at the end of the rod. A plug is disposed within the interior of the separated segments, preferably being cast in place. A socket is formed around the exterior of the segments, also preferably being cast in place within a fitting disposed around the enlargement. A relatively thin barrier film of friction reducing material is applied to the exterior of the enlargement, forming a slip plane between the enlargement and the socket, so that upon the application of longitudinal tension to the rod all of its strands and the plug will simultaneously move longitudinally with the socket to convert such tension into lateral compression which transfers the load across the entire cross-section of the rod.

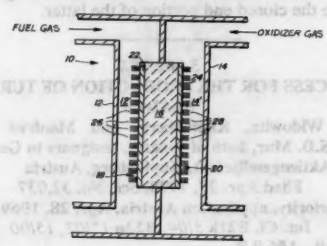
3,660,888

PROCESS FOR MAKING ELECTRICAL ENERGY SOURCES

Sheldon L. Epstein, Wilmette, Ill., and Bernard W. Wessling, Winthrop, Mass., assignors to Brunswick Corporation, Chicago, Ill.

Filed July 24, 1969, Ser. No. 845,945
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.3 **14 Claims**

The specification describes a molten carbonate fuel cell electric energy source incorporating a novel pair of electrodes comprising a pair of permeable thin metallic films painted on a magnesia electrolyte matrix and a plurality of fiber metal wicks flocked onto the films. During operation, the molten carbonate electrolyte permeates the wicks, which extend into the gas manifolds, to provide very large surface areas for three-phase fuel cell reactions covered by thin films



of electrolyte supplied by large reservoirs in the wicks to minimize cell overvoltage. In addition to the preferred embodiment, a process for fabricating fuel cells and electrochemical electrodes is described. Also, applications to other types of fuel cells, batteries and electrochemical systems are described.

3,660,889

METHOD OF MAKING A WEAR BLADE FOR AN OIL DRILLING TOOL

William James Groom, Belton, England, assignor to Lion Oil Tool Holdings (International) Limited, Great Yarmouth, Norfolk, England

Filed Nov. 3, 1969, Ser. No. 873,370
Claims priority, application Great Britain, Nov. 6, 1968, 52,689/68
Int. Cl. B23p *17/00*
U.S. Cl. 29—475 **4 Claims**

A method of making oil drilling tools, particularly stabilizers, and wear blades therefor. The blades are made and dressed on a separate former to avoid pre-heating the tool body. They are then welded to the tool body by a low heat electric welding technique and are arranged around the body equally spaced and skewed in an anti-clockwise direction, the total circumferential coverage being complete. Typically there are four blades each skewed 90°.

3,660,890

METHOD FOR JACKETING CYLINDRICAL ARTICLES

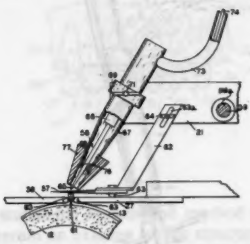
Rupert Douglas Terry, Toledo, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.

Filed July 28, 1969, Ser. No. 845,404
Int. Cl. B23k *31/02*
U.S. Cl. 29—477 **11 Claims**

A duct of thermal insulation is jacketed with a gas impermeable sheet material with a longitudinal seam formed by turning the mating ends of the sheet material outwardly and thermally fusing those ends into a linear nodular bead. In the case of metal foils of a few thousandths of an inch in

thickness the bead is of the order of a thirty-second of an inch and is turned into the foil jacket to present a smooth non-cutting surface.

Semi-butt welds of foil are made by clamping the foil in face to face relationship along an essentially line contact and moving an arc welding electrode with associated gas jets for a non-oxidizing gas parallel to and in close spaced relation to the clamp line. Jacketing for preformed ducts of glass or other fiber type insulation is drawn from a supply of sheet stock to form a catenary loop in which a preformed duct is



placed. Jaws forming unitary clamps and welding electrodes are closed to close the opposite sides of the loop of foil around the duct and upon each other. The foil is severed closely adjacent the clamps and the electrode with its jets for the gas is moved along the exposed edges of foil adjacent the electrode clamps while drawing an arc to fuse the opposed foil surfaces together. The clamps are then released, the jacketed duct removed from the welding apparatus and the radially extending, fused foil bead pressed parallel to the outer face of the duct.

3,660,891

FILLER METAL ALLOY FOR TITANIUM BRAZING

Geoffrey Martin, Nashville, Tenn., assignor to Avco Corporation, Nashville, Tenn.

Filed Sept. 21, 1970, Ser. No. 74,153
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 **6 Claims**

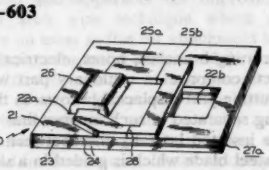
The disclosure is a brazing method for uniting two or more titanium components, e.g., as in fabricating titanium honeycomb sandwich structures, utilizing a filler metal alloy composition which has the unique property of not only permitting the formation of strong brazed joints but also permitting the brazing operation to be carried out at lower temperatures and within a temperature range that is increased more than three-fold over that heretofore attainable.

3,660,892

METHOD FOR MAKING A MULTI-CHANNEL MAGNETIC HEAD

Takashi Tanaka, and Yukihiro Yanagiuchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Aug. 28, 1970, Ser. No. 67,822
Claims priority, application Japan, Sept. 10, 1969, 44/73083; July 6, 1970, 45/59262
Int. Cl. G11b *5/42*; H01f *7/06*
U.S. Cl. 29—603 **5 Claims**



A method of making a multi-channel magnetic head. A support plate having a flat surface is provided, and a magnetic core having a winding wound thereon is placed on said flat surface of said support plate in order to make an elementary unit. A plurality of said elementary units is stacked on one another, and said stacked elementary units are adhered to each other. The stack is cut into two halves in at least one plane which is perpendicular to the flat surfaces of said support plates and which divides each of the magnetic cores into two parts. The two halves are rejoined with a spacer between them with the core parts in one half matched with corresponding core parts in the other half.

3,660,893

REPLACEABLE BLADE UNIT FOR A SAFETY RAZOR

Norman C. Welsh, Balvaig, Admoor Lane, South End, Bradfield, Berkshire, England

Filed Mar. 24, 1970, Ser. No. 22,237
Claims priority, application Great Britain, Mar. 26, 1969, 15,845/69
Int. Cl. B26b *21/06, 21/22*
U.S. Cl. 30—50 **5 Claims**

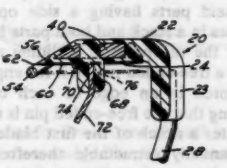
A replaceable blade unit for a safety razor in which the blade is secured in the blade unit at its ends only and the intermediate portion of the blade, on which the cutting edge is formed, is unclamped and held under tension directed longitudinally of the blade parallel to the cutting edge.

3,660,894

SAFETY RAZOR

Robert T. Sand, 5220 McClellan Ave., Detroit, Mich.

Filed Apr. 22, 1970, Ser. No. 30,666
Int. Cl. B26b *21/16*
U.S. Cl. 30—74 **7 Claims**



A safety razor for a removable and replaceable blade which is characterized by a one-piece head and handle with no moving parts utilizing a magnetic holding device for the blade, and an assembly guide which moves the working blade edge in and over a safety bar to position it properly for a shaving angle together with a unique handle combined with the head serving also as a retainer for blade storage.

3,660,895

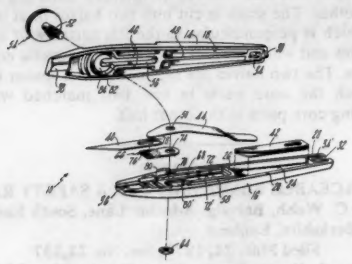
RETRACTABLE UTILITY KNIFE

Robert F. West, Simsburg, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jan. 11, 1971, Ser. No. 105,187
Int. Cl. B26b *1/08*
U.S. Cl. 30—162 **14 Claims**

Retractable utility knife having separable handle parts and connecting means therefor featuring a single locking screw

for releasable securing the handle parts, retracting a blade carrier and serving as a pivot axis for supporting the handle

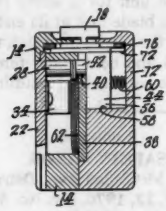


parts for relative angular displacement while continuously retaining the same in assembly.

3,660,896
UTILITY KNIFE

Franklyn G. Umholtz, c/o Russell Harrington Cutlery, Inc., Southbridge, Mass.

Filed Apr. 10, 1970, Ser. No. 27,302
Int. Cl. B26b *29/02*
U.S. Cl. 30—162 **5 Claims**



A utility knife comprising two main parts forming a housing, one of said parts having a side opening therein for receiving blades in a stack and both parts having cooperating guideways for the reception of a sliding manually operated button having a free-ended pin on it for engaging with a complementary notch in an edge of each blade, there being means providing that the free-ended pin is spring-pressed to a position to enter a notch of the first blade only in the stack and being manually retractable therefrom to release the blade.

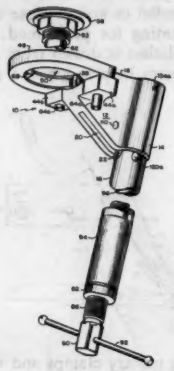
The slider has two locking positions for the blade, one at either end of the housing; two blade-releasing positions adjacent the locking positions whereby the blade may be abstracted manually from either end of the housing, and centrally of the housing the slider has a change position for changing the extent of the blade from the ends of the housing.

3,660,897
NUT SPLITTING TOOL

Arnold L. Gilmore, 2758 El Sabronte St., Santa Clara, Calif.

Filed Oct. 10, 1969, Ser. No. 865,378
Int. Cl. B26b *17/02*
U.S. Cl. 30—184 **13 Claims**

A stationary cutter and a movable cutter are supported in alignment along a common cutting axis by a head fixedly mounted at one end of a shank. The movable cutter is driven along the cutting axis between a retracted position away from the stationary cutter and an extended position toward the stationary cutter by a cam pivotally mounted in the head. A connecting rod couples the cam to an actuating screw threadedly mounted in the other end of the shank along an actuating axis perpendicularly intersecting the cutting axis. As the actuating screw is turned along the actuating axis

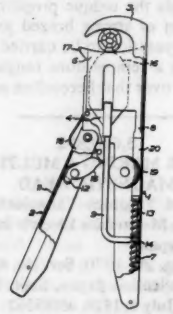


between first and second stop positions the connecting rod actuates the cam to drive the movable cutter along the cutting axis between the retracted and extended positions.

3,660,898
CUTTING TOOL

Per Sigvard Hast, Hastholmsvagen 10, 116 44 Stockholm, Sweden

Filed July 15, 1970, Ser. No. 55,034
Claims priority, application Sweden, Apr. 6, 1969, 10969/69
Int. Cl. B26b *17/02*
U.S. Cl. 30—185 **5 Claims**



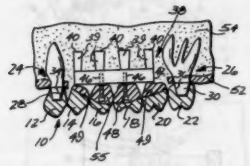
A tool for cutting branches, hoses, electrical conductors, and like objects comprises a stationary part with an abutment, and a cutting part displaceable towards the abutment, said parts being separated in such manner that the object to be cut can be inserted laterally therebetween. The cutting part is a thin steel blade which is guided in a slot in a guide member. According to the invention, the guide member is displaceable towards the abutment and cooperates with a guide in the stationary part, and besides the steel blade and the guide member cooperate with spring means tending to retain the steel blade within the guide part.

3,660,899

BRIDGE STABILIZING SYSTEM

Leonard I. Linkow, 30 Central Park South, New York, N.Y.

Filed Sept. 16, 1970, Ser. No. 72,609
Int. Cl. A61c 13/22
U.S. Cl. 32—5 10 Claims



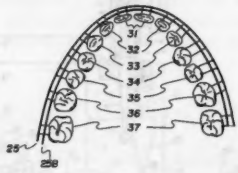
A bridge stabilizing system and method of using same is provided wherein an existing bridge structure may be stabilized directly in the underlying bone structure without the necessity of removing the bridge from its operative engagement with the stubs of natural abutment teeth. To this end, the system comprises a bridge stabilizing implant having a blade edge at one end thereof and a shoulder portion at the other end thereof provided with means for receiving one end of a shaft. The other end of the shaft is adapted to be received in a hollowed out portion of the existing bridge structure. The implant is tapped into the bone and the shaft is placed in its operative position extending into a hollowed-out portion of the bridge structure, after which the hollow is filled with a cold cure acrylic resin to provide operative stabilizing engagement between the implant and the bridge.

3,660,900

METHOD AND APPARATUS FOR IMPROVED ORTHODONTIC BRACKET AND ARCH WIRE TECHNIQUE

Lawrence F. Andrews, 1808 Cable St., San Diego, Calif.

Continuation-in-part of application Ser. No. 669,919, Sept. 22, 1967, now Patent No. 3,477,128, dated Nov. 11, 1969. This application Nov. 10, 1969, Ser. No. 875,086
Int. Cl. A61c 7/00
U.S. Cl. 32—14 A 30 Claims



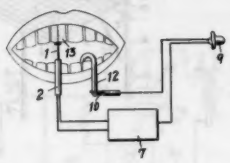
The method and apparatus for improving orthodontic bracket and arch wire technique where the individual brackets have an inner radius for attachment to a tooth band which conforms to the outer contour of the tooth both vertically and horizontally and has at least one groove therein for the reception of one or more arch wires having a radius for conforming to overall arch wire geometry and wherein the groove is cut with a torquing angle, a tipping angle, an in-out dimension and in some cases, a rotation compensation angle for cooperation with an unbent arch wire in which the various angles built into the bracket result in desired force vectors for movement of individual teeth to a desired position, and in the alternative the variations in dimensions and angles are built into the tooth band.

3,660,901

INSTRUMENT OF PROBING THE LENGTH OF A ROOT CANAL OF THE TOOTH

Noboru Inoue, Tokyo, Japan, assignor to Yugen Kaisha Hayashi Shika Sloten, Tokyo, Japan

Filed July 9, 1971, Ser. No. 161,059
Claims priority, application Japan, Aug. 8, 1970, 45/69017
Int. Cl. A61c 3/00
U.S. Cl. 32—40 1 Claim



An instrument for measuring the length of a root canal of the tooth provided with a transistor amplifier, at the input side thereof a probe needle for inserting into the root canal and at the output side thereof an oral mucous membrane conductor. Between the point of the probe needle and the oral mucous membrane conductor is electrically connected through a human body to form a circuit whereby the variations in low frequency oscillation due to feedback are delivered as oscillation sounds to the ear of the dentist. When the predetermined degree of oscillation sound comes to be audible, the length of the root canal is measured with an impregnated length of the probe.

3,660,902

APPARATUS FOR CLEANING OR POLISHING OF TEETH

Per A. T. Axelsson, Drottninggatan 27, Karlstad, Sweden

Filed Apr. 24, 1970, Ser. No. 31,564. The portion of the term of the patent subsequent to Jan. 5, 1988, has been disclaimed.
Int. Cl. A61c 3/06
U.S. Cl. 32—58 9 Claims

A dental apparatus for home care of teeth is disclosed. The apparatus comprises a wedge-like and pointed tool adapted for insertion into teeth interstices for cleaning the approximate teeth faces, and a handle whereby the tool can be easily operated. A stem of the tool is held with friction grip by a socket inserted transversely through the end of the handle and completely free to turn about its axis so that the tool by itself adjusts its angular position to the teeth faces being cleaned.

3,660,903

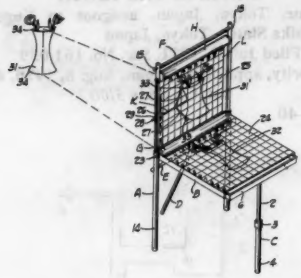
DRAWING AID

George H. Caperton, Jr., 1850 Hilliard Rd. Apt. 104, Rocky River, Ohio

Filed July 28, 1969, Ser. No. 846,312
Int. Cl. G01c 3/00
U.S. Cl. 33—64 D 4 Claims

As a drawing aid a plurality of sets of grids of different line spacings are drawn on transparent flexible sheet material and mounted on spaced rollers so that one or another of the set of grids can be turned into view according to the nature of the subject to be drawn as seen through the transparent grid sheet. A drawing surface has grids of similar spacing marked thereon for use in reproducing the subject seen through the

grid of the transparent sheet. The grid rollers are mounted on



a collapsible structure which is convertible from a drawing table to an easel.

3,660,904

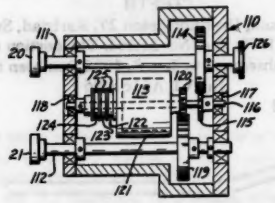
EXTENSOMETER AND ATTACHMENT

Robert D. Steele, Eldorado, and Richard J. Farris, Citrus Heights, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Original application Nov. 4, 1966, Ser. No. 592,018, now Patent No. 3,416,233. Divided and this application May 29, 1968, Ser. No. 749,233

Int. Cl. G01b *5/30*

U.S. Cl. 33—147 D **1 Claim**



An extensometer having a pair of spaced friction wheels rotatable on parallel axes, which engage the side of a test specimen and are in operable association with an elongation indicator. The elongation indicator is a pair of cooperating members rotatable relative to each other and associated with each other so that the position of one of the members is directly ascertainable relative to the other. One of the members is coupled to one of the wheels and the other member is coupled to the other wheel whereby differential rotation of the wheels produces corresponding change of the relative positions of the two members and therefore gives a direct indication of the elongation of the specimen.

3,660,905

DISC BRAKE LINING THICKNESS GAUGE

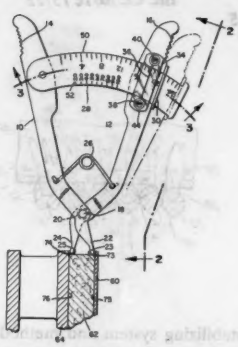
Frederick R. McFarland, and Walter L. Diffenderfer, both of Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.

Filed Sept. 26, 1969, Ser. No. 861,316

Int. Cl. G01b *5/00*

U.S. Cl. 33—148 R **2 Claims**

A caliper type tool, scissors-like and spring biased open is provided with a scale means which accurately reads an amplified measurement, either in fractions, or percentages of the amount of lining left on a brake lining for disc brakes,



while the lining is in assembled position in the disc brake assembly.

3,660,906

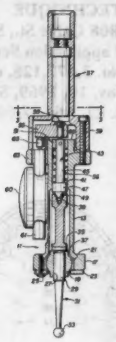
THREE-AXIS INSPECTION PROBE

Harry M Zimmerman, Roseville, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Continuation of application Ser. No. 680,841, Nov. 6, 1967, now abandoned. This application Mar. 17, 1969, Ser. No. 818,852

Int. Cl. G01b *7/28*

U.S. Cl. 33—174 L **6 Claims**



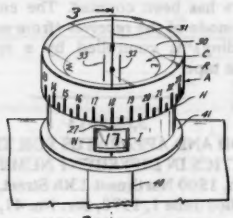
An inspection probe capable of accurate output in three axes, having a spherical probe tip affixed to an arm. Medially disposed about the arm between the end of the spherical tip and the opposite end of the arm is a pivot ball permitting the arm to pivot at its midpoint within a housing provided. The arm passes through the spherical ball permitting additionally linear movement relative to the pivot ball. Adjoining the end of the pivot arm is a transfer pin restricted to solely linear motion. The end of the probe arm and the adjacent surface of the transfer pin are provided with adjoining sliding surfaces so that all movement of the probe tip is thus transferred into linear movement of the transfer pin in a ratio of 1:1. The transfer pin in turn effects a suitable gauge for reading the movement of the probe tip.

3,660,907

UNDERWATER NAVIGATION INSTRUMENT

Lonnie A. Sutherland, 12819 Corpus Christi, Houston, Tex.

Filed Sept. 3, 1969, Ser. No. 854,950
Int. Cl. G01c *17/14*
U.S. Cl. 33—222 1 Claim



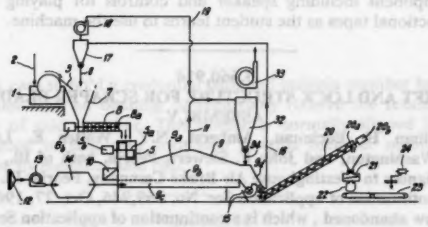
A device adapted to be worn on a diver's wrist for indicating a course underwater comprising a magnetic compass mounted in a case having a side window with means attached to the compass for presenting a visual representation of the actual course on which the diver is heading and a movable reference indicator on the case for presenting a visual indication of the desired course adjacent the window. Such device also includes a rotatable lubbers line movable with the rotatable indicator and extending across the face of the compass for alignment with indicator lines on the face of the compass for presenting a visual course indication on the face of the compass.

3,660,908

PROCESS AND APPARATUS FOR DRYING MICRO-ORGANISMS, IN PARTICULAR EDIBLE YEASTS

Paul Bardot, Paris, France, assignor to Societe Pour L'Equipement Des Industries Chimiques Speichim, Paris, France

Filed Sept. 15, 1970, Ser. No. 72,334
Claims priority, application France, Sept. 15, 1969, 6931305
Int. Cl. F26b *5/08*
U.S. Cl. 34—8 15 Claims



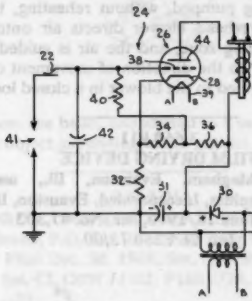
An aqueous suspension obtained by culturing a micro-organism, especially a fodder or edible yeast, is treated to give a dried product by concentrating it as by filtration, bringing it to a solids content at which it can be pelleted, forming it into pellets, and drying the pellets by a fluidized bed technique at a temperature of 50° to 400° C. The solids content of the concentrate can be further increased as required by a pre-drying step at a temperature of 50° to 400° C., or preferably by recycling and mixing with it part of the dried material.

3,660,909

DRYER CONTROL

Dale F. Willcox, Aurora, Ill., assignor to Controls Company of America, Melrose Park, Ill.

Continuation of application Ser. No. 383,542, June 29, 1964, now abandoned, which is a continuation of application Ser. No. 31,922, May 26, 1960, now abandoned. This application Dec. 18, 1970, Ser. No. 99,398
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 18 Claims



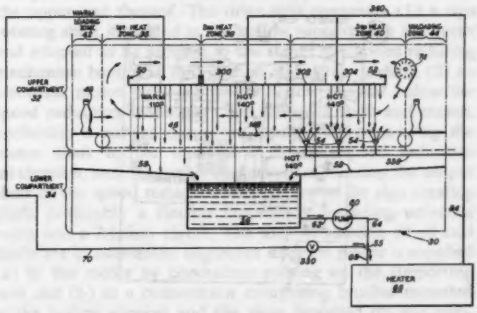
The sensing rings mounted in the dryer drum are bridged by the tumbling clothes. The voltage is impressed on one of the rings and leaks to ground through the other ring allowing the bias on the grid of the triode to change until the triode passes enough voltage to actuate the relay. The resistance bridging the rings is integrated by reason of the capacitor in the circuit. The triode and relay operate as an electronic switch controlling energization of a power relay to shut off the dryer on receipt of the dry signal or to start a timer to provide an additional time delay period. In another version, the time to reach 20 percent moisture level is measured and the 20 percent moisture signal actuates the timer to continue running for a predetermined proportion of the measured period before shutting off the dryer.

3,660,910

APPARATUS FOR HEATING AND DRYING CHILLED, FILLED CONTAINERS

Grover C. Evans, and Thomas J. Evans, both of Little Rock, Ark., assignors to G. C. Evans Products Corporation, Little Rock, Ark.

Filed Oct. 21, 1970, Ser. No. 82,711
Int. Cl. B08b *3/00*
U.S. Cl. 34—60 14 Claims



Apparatus for heating and drying chilled, filled containers such as bottles and cans. The apparatus comprises an en-

closed housing with upper and lower compartments. Upper compartment has first, second, and third heat zones between loading and unloading zones A screen-type conveyor moves containers successively from the loading zone, through the heat zones, to the unloading zone. The containers are successively heated by: (a) overhead warm water spray in the first heat zone; (b) overhead hot water spray in the second heat zone; and (c) a combination of overhead and underneath hot water sprays in the third heat zone. Water collects in a tank in the lower compartment for re-use. Water is pumped direct from the tank and split into two streams: one stream being reheated and pumped to the second and third heat zones; the other stream being pumped, without reheating, to the first heat zone. An overhead blower directs air onto the containers in the loading zone; and the air is guided along the conveyor opposite to the direction of movement of the containers, and is recycled to the blower in a closed loop.

3,660,911

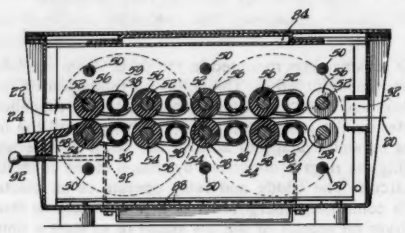
FILM DRYING DEVICE

Donald A. Buckingham, Evanston, Ill., assignor to Buckingham Graphics, Incorporated, Evanston, Ill.

Filed June 18, 1970, Ser. No. 47,303

Int. Cl. F26b *13/00*

U.S. Cl. 34—160 **10 Claims**



A device for drying film comprising a housing, a transfer assembly connected to the housing for delivering sheets of film along a predetermined path, means for producing a continuous flow of warm air and a plurality of tube assemblies for directing the flow of warm air to the film for drying the same.

3,660,912

TEACHING MACHINE

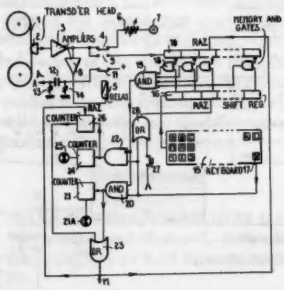
Jacques Laplume, Gif-sur-Yvette, France, assignor to Societe D'Etudes Techniques et D'Entreprises Generales SODETEG, LePlessis-Robinson, France

Filed Nov. 26, 1969, Ser. No. 880,144

Claims priority, application France, Nov. 26, 1968, 175325

Int. Cl. G09b *7/04*

U.S. Cl. 35—9 A **12 Claims**



A movable record, such as a magnetic tape stores instructional items in paragraph form; associated with each instructional item is a code, recorded on the tape, indicative of a correct answer. A student-operated keyboard is provided which, upon depression of a key indicative of the correct answer, as instructed by the instructional item recorded on the tape, will provide a signal which is compared with a signal derived from the code recorded on the tape and, upon coincidence, causes the tape to proceed to the next instructional item. Upon non-coincidence, an "error response" is indicated; the next, or a subsidiary instructional item will be displayed to the student when a predetermined number of incorrect answers has been counted. The ends of items and switch-over of mode of the receiver (from sound for the student to decoding) is controlled by a special frequency recorded on the tape.

3,660,913

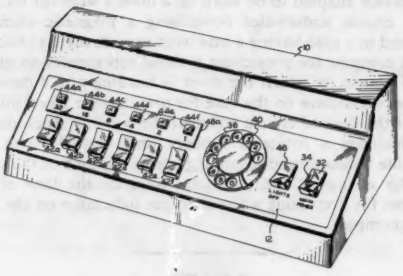
METHOD AND APPARATUS FOR TEACHING MATHEMATICS IN DIFFERENT NUMBER SYSTEMS

James L. Heath, 1500 Northwest 13th Street, Corvallis, Oreg.

Filed June 1, 1970, Ser. No. 41,846

Int. Cl. G09b *19/02*

U.S. Cl. 35—30 **13 Claims**



A method and apparatus for teaching relationships between the calculations in different number bases using a simple computer unit. The unit has a manually operable decimal input dial, manually operable binary input switches, an electrical counting circuit activated by the manual input devices, binary output indicators including a series of indicator lamps corresponding to the capacity of the counting circuit, but no memory. Interchangeable indicia strips can be placed in conjunction with the indicator lamps with indicia expressing the binary output in terms of its decimal, exponential or other equivalent. Remote dial input and large display light attachments facilitate classroom instruction. A modification of the unit has a built-in tape cassette playback component including speaker and controls for playing instructional tapes as the student learns to use the machine.

3,660,914

LIFT AND LOCK STRUCTURE FOR SCRAPER BLADE ASSEMBLY

William H. Bechman, Amherst, N.Y.; Walter E. Lott, Washington, and John F. Siewert, Peoria, both of Ill., assignors to Westinghouse Air Brake Company, Peoria, Ill.

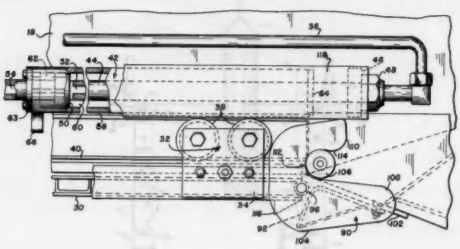
Continuation of application Ser. No. 869,946, Oct. 27, 1969, now abandoned , which is a continuation of application Ser. No. 684,103, Nov. 20, 1967, now abandoned. This application Sept. 15, 1970, Ser. No. 72,505

Int. Cl. E02f *3/62*

U.S. Cl. 37—129 **6 Claims**

An earthmoving scraper of the type having a bowl assembly including a cutting edge fixed on the forward end thereof, the bowl assembly being defined by a pair of side walls, an ejector forming a rear wall, and a bowl floor rearwardly of the cutting edge, the bowl floor being slidable to a rearward position relative to the side walls to expose a material ejection opening. To facilitate control of the depth of spread or fill during material unloading, a strike-off blade

is pivotally supported on the slidable floor, the strike-off blade being adapted to be pivoted to a lower, operational position when the floor is moved to a rearward or unloading position. Cam and stop means operatively associated with the strike-off blade and the side walls, are provided for moving the strike-off blade to an upper position when the floor is in a



forward position wherein the strike-off blade forms a load-supporting extension of the floor. In this environment, the present invention provides lock means for locking the strike-off blade in the upper position thereby circumventing accidental loss of payload as might be occasioned by undesired downward pivotal movement of the strike-off blade caused by the payload weight thereon, or by shock loads.

3,660,915

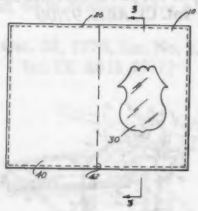
CREDENTIAL AND INSIGNIA HOLDING CASE

Gerard Richard Davis, North Smithfield, R.I., assignor to V. H. Blackinton & Co. Inc., North Attleboro, Mass.

Filed Nov. 19, 1969, Ser. No. 878,042

Int. Cl. G09f *3/18*

U.S. Cl. 40—10 R **4 Claims**



A case to hold a credential card and insignia member has a holder with an opening to removably receive the retaining clip of said member. This holder is normally slipped into position in said case with said insignia member mounted there by means of said clip.

3,660,916

IDENTIFICATION SYSTEM

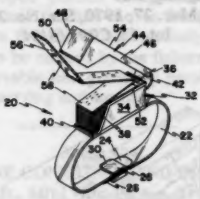
Clifton E. McDermott, Salt Lake City, and Darrell B. Steiniche, Bountiful, both of Utah, assignors to Bio-Logics, Inc., Salt Lake City, Utah

Filed Nov. 10, 1969, Ser. No. 875,141

Int. Cl. G09f *3/14*

U.S. Cl. 40—21 C **4 Claims**

An identification band has a receptacle for receiving a series of detached or detachably joined labels and dispensing structure for dispensing the labels one at a time. The method includes providing a plurality of labels with indicia including coded identification and placing the labels in an identification band. When the band is attached to a patient and object or the like, the labels may be serially detached and/or



removed from the band, and affixed to a secondary object to identify the object as relating to the patient.

3,660,917

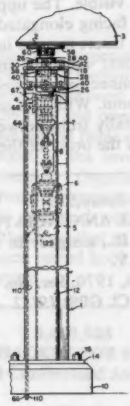
DRIVE UNIT FOR ROTATABLE SIGNS

James W. Bevan, P.O. Box 2515, Salt Lake City, Utah

Filed Dec. 30, 1969, Ser. No. 889,148

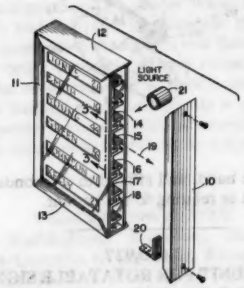
Int. Cl. G09f *11/02*; F16h *1/28, 67/00*

U.S. Cl. 40—33 **12 Claims**



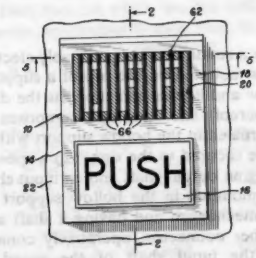
A drive unit for a rotatable sign, preferably electrically illuminated, which is mounted on the top of a supporting post. The post is hollow and houses and supports the drive unit in the upper end thereof. The drive unit comprises (1) a sign rotating shaft journaled in the hollow support with the upper end adapted to be secured to the sign, (2) a speed reducing mechanism having an output shaft and an input shaft, (3) an electrical motor mounted in the hollow support below the speed reduction mechanism and having a shaft and means, preferably a rubber connector, operatively connecting the motor shaft to the input shaft of the speed reduction mechanism, and (4) means operatively connecting the output shaft of the speed reduction mechanism to the sign rotating shaft, preferably a flexible connection including universal joints and a friction clutch. The axes of rotation of all said shafts are in substantial alignment. Electric power is supplied (a) to the motor by conductors passing up the supporting post and (b) to a commutator comprising brushes mounted in the hollow support and slip rings mounted on and insulated from the sign rotating shaft through which electrical conductors pass from the slip rings upwardly into the sign to provide the illumination.

3,660,918
NEGATIVE INSERT HOLDER FOR BUSINESS DIRECTORIES
Robert I. Bourseau, Marina Del Rey, Calif., assignor to Architectural Signing, Inc.
Filed Mar. 27, 1970, Ser. No. 23,159
Int. Cl. C09f 13/04
U.S. Cl. 40—64 3 Claims



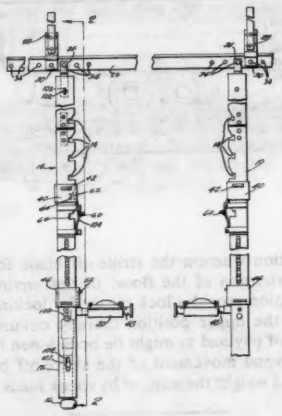
A directory sign includes a frame for holding a plurality of identical inserts in a vertical column, the inserts displaying name bearing media. Each insert includes a front wall having a cut-out window through which the name on the medium inserted behind the wall is visible. The upper and lower flange means define oppositely facing elongated channels such that the upper channel of the insert may be intercoupled with the lower channel of the next adjacent insert thereabove to define a light proof connection between adjacent inserts when in the vertical column. With this arrangement any one insert is slidable horizontally from between the adjacent inserts to effect a change in the order of the names.

3,660,919
OPTICAL ANNUNCIATOR
Robert I. Nagel, Skokie, Ill., assignor to Amerace Esna Corporation, New York, N.Y.
Filed June 26, 1970, Ser. No. 50,043
Int. Cl. G09f 19/12
U.S. Cl. 40—78.03 24 Claims



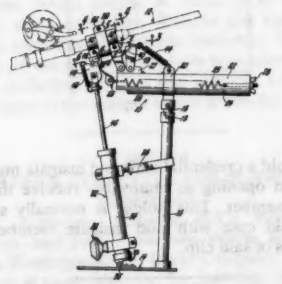
An optical annunciator in which any one of alternate visual displays is revealed for viewing over the entire obverse surface of a lenticulate lens by the displacement of display means juxtaposed with the reverse surface of the lenticulate lens, the display means including alternate visual displays, each divided into portions, each portion of a display being located between adjacent portions of another display, and masking means for blocking from view those portions of the display means which do not form a part of the revealed display.

3,660,920
HIGH-LOW STILTS
John A. Spina, 15 Elom Street, Pittsfield, Mass.
Continuation-in-part of application Ser. No. 690,659, Dec. 14, 1967, now abandoned. This application Apr. 3, 1970, Ser. No. 25,540
Int. Cl. G09f 7/00; A61f 3/00
U.S. Cl. 40—129 2 Claims



A stilt that is adjustably repositioned to a high or a low position for use, with adaptability and capability of use with various sized shoes of the user, and in which falling or losing or shifting of the user's balance is substantially eliminated.

3,660,921
TRIGGER ACTUATED POWER UNIT
Leo G. McDonnell, 19917 Kinloch, Detroit, Mich.
Filed Jan. 16, 1970, Ser. No. 3,449
Int. Cl. A01k 97/00
U.S. Cl. 43—15 8 Claims



The improvement in a trigger actuated power unit is disclosed comprising a fluid powered power train operative in conjunction with a spring powered power train, said fluid powered power train having a moveable member which is power actuated in the power stroke thereof, and latch means for latching said moveable member train in active cocked position in operative relation to said moveable object so that upon application of said external force said fluid powered power train is triggered to effect a power stroke in which said moveable object is power actuated at least in part by said moveable member.

3,660,922

FISH HOOK SETTING DEVICE

Duane Charles Chill, 1015 West Washington, Sandusky, Ohio

Filed Mar. 18, 1970, Ser. No. 20,642
Int. Cl. A01k 97/00
U.S. Cl. 43—15 10 Claims

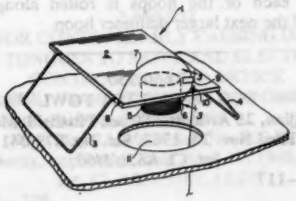
A fish hook setting device comprising a cylindrical housing containing a compression spring. The housing is open at one end and has a notched lip at its opening. A thin flexible leader passes through the opening of the housing and is connected to the spring at one end and to a fish hook at its other end. A small bead is held on the leader remote from the notched lip when the spring is relaxed. The device is cocked by drawing the leader down to seat the bead behind the notched lip and thereby maintain the device in the cocked state against the urging of the spring.

3,660,923

FISHING DEVICE, ESPECIALLY FOR ICE FISHING

Ronald R. Johnson, 6438 Walker Drive Air Park West, Lincoln, Nebr.

Filed Oct. 20, 1970, Ser. No. 82,318
Int. Cl. A01k 97/12
U.S. Cl. 43—17 12 Claims



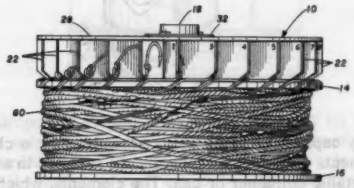
A tip-up type fishing device, primarily for ice fishing, includes a platform-like body member provided with adjustable legs for supporting it generally horizontally. A spool wound with fishing line is fixedly mounted on the bottom of the platform. A signaling device, in the form of an elongate spring member, normally projects upwardly from the platform, and is adapted to be set by being flexed into a bowed configuration with its free end bearing against a cocking member projecting from the upper surface of the platform. In use, a desired length of fishing line is unwound from the spool, and then a portion thereof is trained around the cocking member. The signaling spring is then flexedly bowed into position against the cocking member, and the looped portion of the line is removed from behind the cocking member and placed against the spring immediately adjacent its engagement with the cocking member. The remainder of the line passes down through the usual hole in the ice. A slight tug on the line by a fish pulls the looped portion away from the spring and cocking member, and the line moves freely from the spool. The initial tug on the line simultaneously frees the spring signaling device to be noticed by the fisherman. The legs and the spring are movable into generally parallel positions with the platform for carrying and storing.

3,660,924

TROTLINE CONTAINER AND DISPENSER

Roger V. McGee, Jr., 6011 Gaston, Apt. 216, Dallas, Tex.

Filed Sept. 30, 1970, Ser. No. 76,811
Int. Cl. A01k 97/06
U.S. Cl. 43—54.5 A 20 Claims



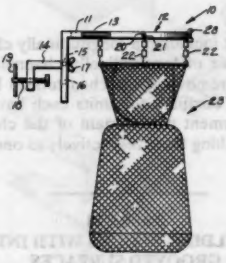
A trotline containing and dispensing apparatus which includes a reel for receiving a trotline and a series of hook-retaining compartments positioned on an outer circumferential portion of the reel and opening radially of the reel for receiving and retaining the fishhooks from the trotline. In a preferred embodiment of the invention, an apparatus is provided for automatically dispensing a baited trotline whereby the reel is rotatably mounted on its axis and each hook compartment is provided with means for releasably retaining a baited fishhook so that as the trotline is unreeled from the apparatus, each baited hook is sequentially released from a hook compartment.

3,660,925

BOAT BRACKET FOR FISH NETS

Glenn E. Miller, 6220 Cumberland Avenue, Apt. 201, Springfield, Va.

Filed Apr. 21, 1970, Ser. No. 30,529
Int. Cl. A01k 97/00
U.S. Cl. 43—55 4 Claims



A device for supporting a fish net from a boat includes an adjustable clamp for securing it to the boat while the net depends downwards from a ring portion of the device, the ring portion being adjustable by the use of a bolt and wing nut fastener.

3,660,926
MAGNETICALLY COUPLED TOY ASSEMBLY

George Lerner, Freeport, and Julius Ellman, Brooklyn, both of N.Y., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

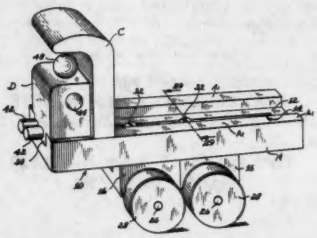
Filed May 15, 1970, Ser. No. 37,635
Int. Cl. A63h 33/00
U.S. Cl. 46—1 F 2 Claims

A toy capable of being easily assembled by a child. The components or elements of the toy are supplied in a bag held in a metallic container or can. The elements, which may be facial features and decorative items, are provided with magnet means enabling them to be attached or secured to the container forming a face with attractive accessories such as a hat or the like.

3,660,927
COMBINATION MOBILE TOY

Eugene De Christopher, 326 Sprague Road, Penn Valley, Pa.

Filed Mar. 10, 1969, Ser. No. 805,520
Int. Cl. A63h 33/06
U.S. Cl. 46—17 4 Claims



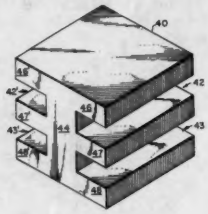
A basic toy unit including a longitudinally channeled body member and a pair of longitudinally channeled wheel supporting members removably attached to said body member, and a plurality of auxiliary toy units each having means for interfitting engagement with certain of the channels in said members for attaching them respectively to one of said members.

3,660,928
MODULAR BUILDING BLOCKS WITH INTERFITTING GROOVED SURFACES

Jorge Picazo Michel, Presa Valsequillo 17, Col. Irrigacion 10, Mexico City, Mexico

Filed Aug. 28, 1970, Ser. No. 67,761
Int. Cl. A63h 33/08
U.S. Cl. 46—25 5 Claims

A set of building blocks including five basic inter-related elements including two cubical elements having longitudinal grooves along opposite sides of the cube, two semicubical elements one having a longitudinal groove along one side thereof and the other having two longitudinal grooves along



one side thereof, and a fifth member comprising an equilateral prism having a base of the same size as one side of a cubical member.

3,660,929
WHIRLING HOOP TOY

A. W. Atkinson, P. O. Box 3925, Wake Village, Tex.

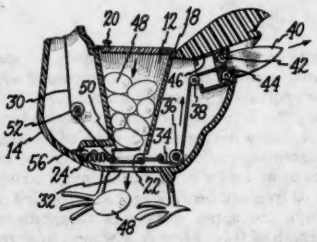
Filed Feb. 26, 1971, Ser. No. 119,286
Int. Cl. A63h 1/10
U.S. Cl. 46—47 10 Claims

A whirling hoop toy for entertainment and competition and as an object of skill. The toy includes a plurality of hoops of decreasingly smaller diameters which are rollably mounted within each other. A rod having a handle at one end and a hoop guard means on the other end is extended through the hoops so as to have the hoops disposed on the rod in operative relation to the hoop guard means, whereby when the rod is whirled, each of the hoops is rolled along the inner periphery of the next larger diameter hoop.

3,660,930
EGG LAYING TOY FOWL

Arpe G. Indjian, 25 Arlington Street, Pittsfield, Mass.

Filed Nov. 24, 1969, Ser. No. 879,041
Int. Cl. A63h 5/00
U.S. Cl. 46—117 2 Claims



An egg laying toy fowl is disclosed in which a funnel shaped container is provided in the body of the fowl for con-

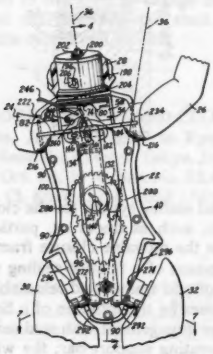
taining a supply of candy eggs. A lid is provided at the top of the container for filling it with the candy eggs. At the base of the funnel shaped container a sliding door is provided, held closed by a spring. The door is connected to a tail feather of the toy fowl such that movement of the tail feather will slide the door to open position, releasing one egg. A sound box connected to the sliding door makes a noise, such as a cackle, each time the door is moved to open position.

3,660,931

SIDE-STEPPING DOLL

Robert Gardel, New York, N.Y., and Egon Gorsky, Westfield, N.J., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 22, 1970, Ser. No. 74,346
Int. Cl. A63h *11/00*
U.S. Cl. 46—120 **17 Claims**



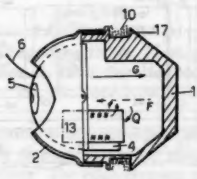
A doll having animated torso, leg, arm and head movement. The torso follows a side to side pivoting movement, with the center of the pivoting taking place at the bottom of the torso. The arms move in unison from side to side. The head oscillates back and forth along with the movement of the torso and arms. The legs propel the doll from side to side, first moving a predetermined number of steps to one side, then reversing the direction and moving the same number of steps to the other side.

3,660,932

DEVICE FOR CONTROLLABLY CAUSING DOLLS EYES AND TONGUES TO MOVE AND ELECTRONIC CONTROL FOR SAID DEVICE

Corrado Raffeli, Via dei Chiavari 6, and Giuliana Somigli, Via L Ruspoli 40, both of Rome, Italy

Filed May 12, 1969, Ser. No. 823,769
Claims priority, application Italy, May 17, 1968, 37048A/68
Int. Cl. A63h *3/40, 33/26*
U.S. Cl. 46—235 **8 Claims**



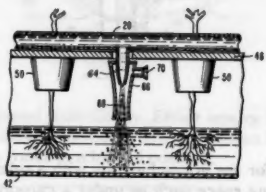
A movable eye or tongue for a doll is provided on the outer surface of a hollow substantially hemispherical member rotatably attached to a hollow support in the dolls head. Electromagnetic means are provided to move the eye or tongue and advantageously comprise a multivibrator circuit supplying a coil on the support the magnetic field of which displaces a permanent magnet on the hemispherical member. The eye and mouth can be linked and can also be dependent upon a voice mechanism.

3,660,933

HYDROPONICS SYSTEM AND METHOD

Edward Wong, Jr., Los Angeles, Calif., assignor to Weingarten & Wong Enterprises, Inc.

Filed Mar. 2, 1970, Ser. No. 15,558
Int. Cl. A01g *31/00*
U.S. Cl. 47—1.2 **13 Claims**



A hydroponics system for growing plants in an aqueous nutrient solution and including troughs for conducting a predetermined level of nutrient solution, is disclosed. The solution is supplied to each trough by a branch pipe extending the length of the trough and including a plurality of outlets spaced at uniform intervals. The nutrients are thereby dispersed relatively evenly along the length of the trough. Each outlet has an associated aspirator or eductor whereby air is entrained by the solution issuing from the outlet thereby providing substantially uniform aeration of the nutrient solution.

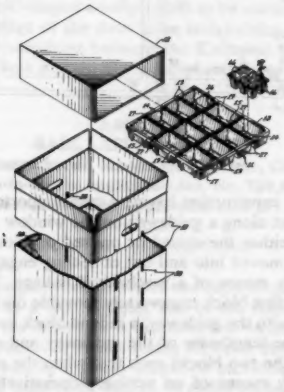
Each plant is supported by a receptacle having an open bottom through which the plant stem extends. The plant is held by resilient foam plastic inserts disposed between the plant stem and the receptacle wall.

3,660,934

MOLDED EXPANDABLE NURSERY TRAY

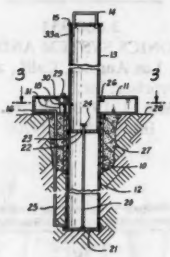
Russell G. Pollack, Phoenix, Ariz., and Horace E. Comer, deceased, late of Phoenix, Ariz. (by Paul T. Wubbolding, executor), assignors to Vaughn's of Arizona, Phoenix, Ark.

Filed May 11, 1970, Ser. No. 36,073
Int. Cl. A01g *9/02*; B65d *21/02*
U.S. Cl. 47—34.11 **7 Claims**



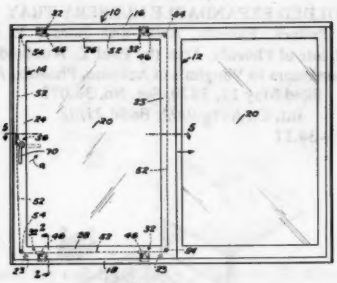
A molded expandable breakaway nursery tray and corregated shipping container therefor.

3,660,935
VEHICLE PARKING SPACE LOCKING DEVICE
Patrick R. Boots, 9150 Gulf Freeway, Houston, Tex.
Filed Mar. 26, 1970, Ser. No. 22,756
Int. Cl. E01f *13/00*
U.S. Cl. 49—35 11 Claims



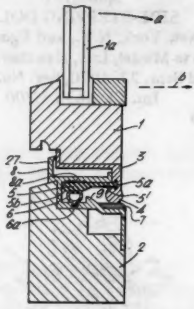
A device for use in combination with a substantially unenclosed parking space such as under a carport or a reserved parking space to selectively permit ingress and egress from the parking space comprising an erectable barrier means operatively mounted in the surface of said parking space to be selectively raised and lowered to thereby control the movement of vehicular traffic into or out of said parking space, means for raising and lowering said barrier from the surface of said parking space and a means for releasably maintaining the barrier in its raised position.

3,660,936
WINDOW CONSTRUCTION
David W. Bryson, 1247 Gordon Court, Clawson, Mich.
Filed Dec. 7, 1970, Ser. No. 95,602
Int. Cl. E05d *15/10*
U.S. Cl. 49—209 12 Claims



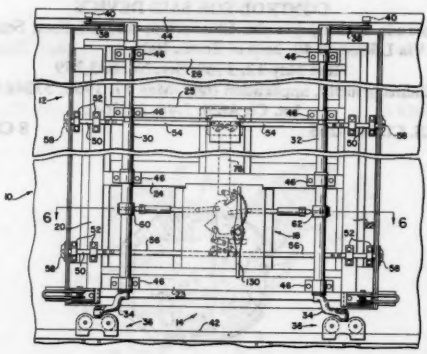
A window construction having a sash supported on rollers for movement along a guideway on the window frame. With the sash in either the closed or opened position, it may be transversely moved into and out of sealing engagement with the frame by means of a mechanical linkage. This linkage comprises a first block transversely movable on the sash and engageable with the guideway, a second block on the window sash movable lengthwise of the guideway and means interconnecting the two blocks such that when the second block is shifted by means of an actuator operatively connected thereto by means of a cable extending around the periphery of the sash, the first block engages the guideway to shift the sash transversely of the frame. The blocks are concealed from sight within a hollow section of the sash.

3,660,937
WINDOWS, DOORS OR THE LIKE
Werner Frach, Bayreuth, and Bernhard Janke, Hohe Flur, both of Germany, assignors to Werner Frach, Bayreuth, Germany
Filed Jan. 30, 1970, Ser. No. 7,084
Claims priority, application Germany, Jan. 31, 1969, P 19 04 648.1
Int. Cl. E05d *15/32*
U.S. Cl. 49—192 15 Claims



A mounting and sealing system for the closures of openings in building walls, such as doors or, particularly, casement windows wherein the movable closure frame is hinged to its fixed frame by means of a flexible sealing strip permanently attached to one of said frames and releasably attached to the other of said frames by the inflation of a hollow tubular section into effective engagement with said sealing strip or with a separate cooperating support bar; the window or the like being, when closed, preferably sealed around its entire periphery by one or a plurality of hollow sections, and provision being made for selectively varying the location of the hinge.

3,660,938
DUAL BRAKE TYPE DRIVE MECHANISM
Irving D. Ross, Jr., Barrington, and Thorvald Madland, Arlington Heights, both of Ill., assignors to Youngstown Steel Door Company, Cleveland, Ohio
Filed June 26, 1970, Ser. No. 50,288
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 5 Claims



The specification and drawings disclose a drive mechanism particularly suited for plug-type rail car doors and arranged to prevent "overspinning" and "drifting." The mechanism disclosed is a double brake-type mechanism and includes a

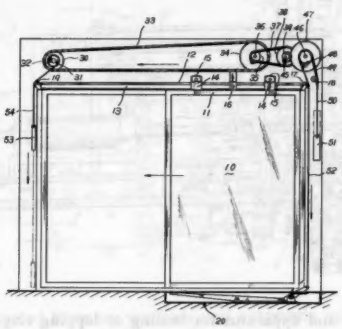
first rotatably mounted member. The first member is arranged to transmit force in either direction of rotation and is connected with an imput drive mechanism and a driven mechanism that, at times, produces forces acting to drive the member in its driven direction at a rate greater than that produced by the imput drive mechanism. The drive mechanism includes a rotatable pinion gear carried on a rotatable imput shaft extending generally parallel to the axis of rotation of the first member. The pinion gear is connected with the shaft by means which cause it to move longitudinally of the shaft to a first or a second spaced point depending upon the direction the shaft is rotated. At each of the points, there are ratchet wheels which are freely rotatable relative to the shaft except when the pinion gear moves to engage them at their respective points. When engaged, the ratchets permit movement of the shaft only in one direction. The arrangement is such that should the driven mechanism begin moving the member at a rate greater than the pinion, the pinion will move longitudinally of the shaft to engage the other ratchet wheel and prevent movement of the shaft in response to force imput from the driven mechanism.

3,660,939

AUTOMATIC DOOR OPENING AND CLOSING MEANS

Shigeo Suita, Suita, Japan, assignor to Ryuichi Mizoguchi, Kishiwada and Masataka Kamiya, Tokyo, Japan

Filed Oct. 20, 1970, Ser. No. 82,428
Int. Cl. E05f *13/04*; E05d *15/06*
U.S. Cl. 49—263 **3 Claims**



In a non-power driven type of automatic door opening and closing means, man's weight applied onto the step board means will be transmitted over to an operating chain, which is carried over between two chain wheels, through combination of poises, gear wheels, chain wheels, sprocket wheels, and a transmitting chain that are arranged adjacent to the door-case; and a door is connected with said operating chain by means of connecting element so that the running of the chain may cause the door to open or close effectively.

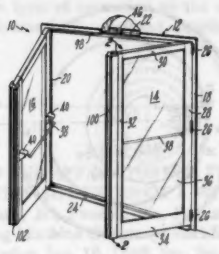
3,660,940

PANIC DOOR

John B. Tavano, 20 Edgewood Drive, Torrington, Conn.

Filed Mar. 4, 1970, Ser. No. 16,414
Int. Cl. E05c *7/04*
U.S. Cl. 49—366 **29 Claims**

A panic door assembly which provides a secure closing due to a special laterally displaceable edge element attached to the free side of the door. The edge element mates with either an adjacent door or a door frame when the door is closed and locked and the edge element is laterally displaced by the door handle to open the door. Where two doors are mounted to a door frame so that they meet at their free sides when closed, each of the doors may be provided with a laterally displaceable edge element, and the confronting profiles of the two edges are made to interengage one another when the doors are locked. With independently operated edges, either



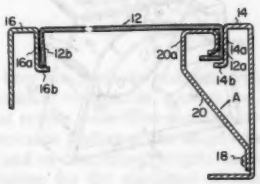
door can be opened individually. Either one or both of the doors may additionally include a bolt mechanism for securing the doors to the frame in a locked position.

3,660,941

DOOR MOUNTING MECHANISM

Tadahiko Shibuya, Tokyo, Japan, assignor to Tamura Electric Works, Limited, Tokyo, Japan

Filed Aug. 19, 1970, Ser. No. 65,203
Claims priority, application Japan, Aug. 21, 1969, 44/65640
Int. Cl. E05d *7/00*
U.S. Cl. 49—397 **2 Claims**



One side edge of a door is bent into L-shaped configuration to oppose the inwardly bent portion of the peripheral flange of a housing. The free end of a resilient anchor plate is shaped into a C-shaped configuration to be received in the L-shaped side edge of the door in an interlocking relationship to clamp the side edge between the C-shaped free end and the inwardly bent portion of the peripheral flange.

3,660,942

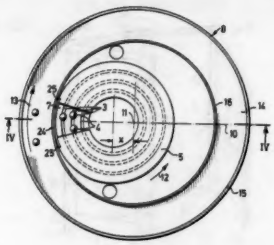
BALL LAPPING DEVICE

Sebastian Messerschmidt, Schonungen/Bavaria, Germany

Continuation-in-part of application Ser. No. 789,614, Jan. 7, 1968, now abandoned. This application Oct. 27, 1970, Ser. No. 84,259
Int. Cl. B24b *7/00*, *5/24*, *1/00*
U.S. Cl. 51—3 **9 Claims**

A ball lapping device comprises two superimposed lapping discs spaced by a working gap, one of the discs being stationary while the other disc is rotatable and includes concentric lapping grooves in its side facing the other disc. The discs are encompassed by a rotary magazine including a circular guide path for balls to be lapped. A radial recess in the stationary disc connects the working gap with the guide path. In one mode of operation balls on the guide path are deflected by a guide from the guide path into the working gap and after being lapped for one revolution are returned by the guide to

the guide path. In a second mode of operation the connection between the guide path and the working gap is closed whereby balls in the grooves are continued to be lapped until they have attained the desired surface finish.

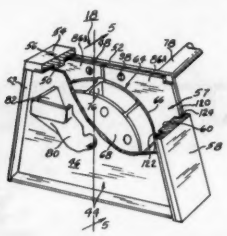


3,660,943

SHOT BLAST CHAMBER AND IMPELLER LINERS

Carl W. Barnthouse, 29243 Southgate Drive, Southfield, Mich.

Filed Jan. 26, 1970, Ser. No. 5,726
Int. Cl. B24c 3/14
U.S. Cl. 51—9 **16 Claims**



A shot blast cleaning unit having an abrasive throwing unit of the rotating impeller type, wherein the sides of the impeller housing are lined with an impact deadening material such as urethane rubber to lengthen their life. The parts to be cleaned by the abrasive are placed upon a rotatably mounted work holding table and rotated into the cleaning chamber formed around a portion of the table. The top surface of the table and the inner surface of the side and top walls of the chamber are also lined with the deadening material to protect the table and walls from the abrasive.

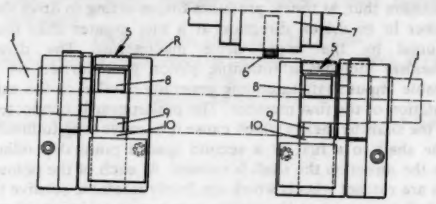
3,660,944

GRINDING MACHINES

John Noel Tittle, Knutsford; Brian Rogers Bottomley, Altrincham, and Eric Warburton, Bolton, all of England, assignors to The Churchill Machine Tool Company Limited, Broadheath, Altrincham, Cheshire, England

Filed Feb. 10, 1970, Ser. No. 10,135
Claims priority, application Great Britain, Feb. 11, 1969, 7,275/69
Int. Cl. B24b 5/18
U.S. Cl. 51—49 **6 Claims**

A grinding machine in which two sets of probes are provided adjacent each of two motorized roll journal rests, each set of probes being set to act on the journals of a roll to be aligned in the machine and being connected with a sensor unit. Each sensor unit is used to control the motor of the adjacent motorized roll journal rest so that a balance of the probes is obtained which corresponds to correct alignment of the roll journal.

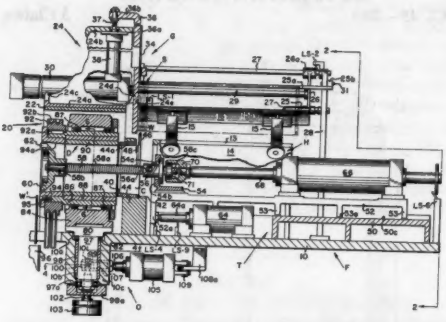


3,660,945

METHOD AND APPARATUS FOR MACHINING RINGS

Edward F. Sullivan, Saginaw, Mich., assignor to B & K Tool & Die Corporation, Saginaw, Mich., a part interest

Filed Apr. 6, 1970, Ser. No. 26,027
Int. Cl. B24b 7/00, 9/00
U.S. Cl. 51—73 R **15 Claims**



Method and apparatus for honing or lapping ring-shaped piston rings, having a gap therein, including mechanism for individually stripping rings from a stack of rings and feeding them individually through a cylindrically shaped lapping drum along the horizontal axis thereof while simultaneously relatively rotating the drum and workpiece. In one version of the machine, as the rings are passing through the drum, the drum is oscillated slightly about a vertically extending axis. After the rings are moved through the cylindrically shaped lapping drum, they are discharged.

3,660,946

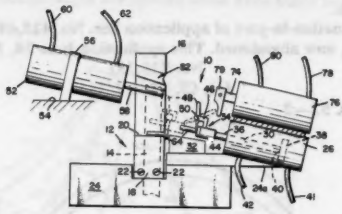
APPARATUS FOR AUTOMATICALLY FEEDING WORK TO A CENTERLESS GRINDER

Douglas L. Thayer, 1622 11th Street, Manhattan Beach, Calif.

Filed June 1, 1970, Ser. No. 41,914
Int. Cl. B24b 5/18
U.S. Cl. 51—103 WH **12 Claims**

Work pieces are automatically fed into grinding position on a work-support blade between the grinding wheel and the regulating wheel of a centerless grinder by a work-gripping apparatus to which the work pieces are fed by a first air cylinder. A second air cylinder closes the work-gripping apparatus onto a work piece and other air cylinder means moves the gripped piece into position adjacent the work-support blade and then releases the piece onto the blade. The work-gripping apparatus is mounted for travel in a plane

forming a suitable acute angle with the work-supporting plane of the work-support blade so that the work-gripping



apparatus finds clearance above the working nip of the wheels.

3,660,947

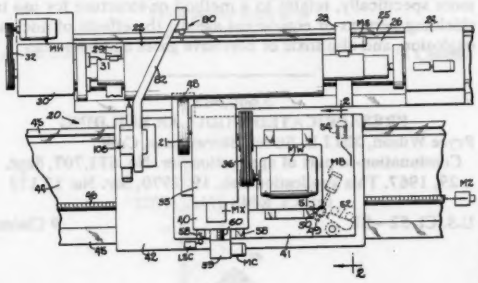
METHOD AND APPARATUS FOR TURNING WORKPIECES

Stephen C. Clark, Jr., Phoenixville, Pa., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Original application Jan. 10, 1969, Ser. No. 790,323. Divided and this application Jan. 25, 1971, Ser. No. 109,523

Int. Cl. B24b *5/04*

U.S. Cl. 51—165 TP **6 Claims**



Disclosed here are methods and automatic apparatus for grinding cylindrical workpieces, such as the contoured rolls used in metal rolling mills. The methods and apparatus involve (1) automatic finding of the lengthwise center of rolls of different and undetermined lengths so as to establish a reference position for the execution of a numerically programmed path defined relative to the center of a roll as a point of symmetry, (2) the storage of the successive instructions of multi-axis movements making up a numerically defined profile or contoured path, and the use of those instructions repeatedly and in whole or in part as called for by different ones of a sequence of commands read from storage and executed in succession, (3) the automatic alignment of the roll axis parallel to the longitudinal axis of motion in a grinding machine by pivoting of one end of the roll about the other until the sensed difference in positions of the roll surface, along an axis transverse to the longitudinal axis and at locations near opposite ends of the roll, is changed to a predetermined fraction of the originally sensed difference, (4) the initiation of grinding passes from that end of a roll which is largest in diameter, so as to avoid "digging in" or increasing the depth of wheel bite as the wheel moves lengthwise of the roll, (5) the execution of continuous passes of the grinding wheel with pre-programmed values of feed rate, wheel speed, roll speed, continuous infeed and incremental infeed until a pre-programmed thickness of material has been removed from the roll surface, and (6) the grinding down of a roll until it is reduced to a diameter equal that of a previously ground roll of a matched pair. These functions are all obtained by the calling out and execution of preestablished routines in response to the reading from storage of pre-programmed sequence commands, so that in the disclosed method and apparatus there is an automatic progression from each type of operation to the next, and with the following of numerically defined profile whenever it is required.

3,660,948

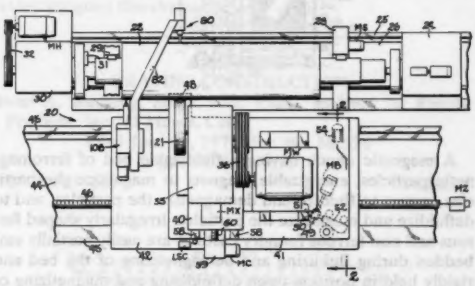
METHOD AND APPARATUS FOR FINDING THE LENGTHWISE CENTER OF A WORKPIECE

Stephen C. Clark, Jr., Phoenixville, Pa., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Original application Jan. 10, 1969, Ser. No. 790,323. Divided and this application Jan. 25, 1971, Ser. No. 109,526

Int. Cl. B24b *5/04*

U.S. Cl. 51—165 TP **9 Claims**



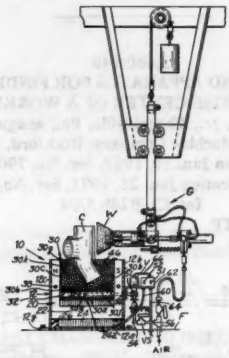
Disclosed here are methods and automatic apparatus for grinding cylindrical workpieces, such as the contoured rolls used in metal rolling mills. The methods and apparatus involve (1) automatic finding of the lengthwise center of rolls of different and undetermined lengths so as to establish a reference position for the execution of a numerically programmed path defined relative to the center of a roll as a point of symmetry, (2) the storage of the successive instructions of multi-axis movements making up a numerically defined profile or contoured path, and the use of those instructions repeatedly and in whole or in part as called for by different ones of a sequence of commands read from storage and executed in succession, (3) the automatic alignment of the roll axis parallel to the longitudinal axis of motion in a grinding machine by pivoting of one end of the roll about the other until the sensed difference in positions of the roll surface, along an axis transverse to the longitudinal axis and at locations near opposite ends of the roll, is changed to a predetermined fraction of the originally sensed difference, (4) the initiation of grinding passes from that end of a roll which is largest in diameter, so as to avoid "digging in" or increasing the depth of wheel bite as the wheel moves lengthwise of the roll, (5) the execution of continuous passes of the grinding wheel with preprogrammed values of feed rate, wheel speed, roll speed, continuous infeed and incremental infeed until a preprogrammed thickness of material has been removed from the roll surface, and (6) the grinding down of a roll until it is reduced to a diameter equal that of a previously ground roll of a matched pair. These functions are all obtained by the calling out and execution of preestablished routines in response to the reading from storage of preprogrammed sequence commands, so that in the disclosed method and apparatus there is an automatic progression from each type of operation to the next, and with the following of numerically defined profile whenever it is required.

3,660,949

WORK HOLDER FOR IRREGULAR SHAPED WORKPIECES

Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Apr. 20, 1970, Ser. No. 29,830
Int. Cl. B24b 41/06; B25b 11/00
U.S. Cl. 51—216 R 13 Claims



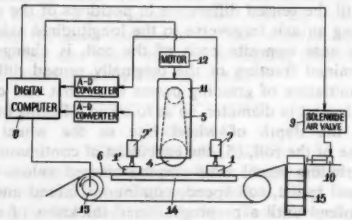
A magnetic chuck having a fluidizable bed of ferromagnetic particles, energizable magnets to magnetize the particles, means to fluidize and demagnetize the particles, and to defluidize and magnetize the particles. Irregularly shaped ferrous and non-ferrous foundry castings are easily partially embedded during fluidizing and demagnetizing of the bed and rigidly held in position upon defluidizing and magnetizing of the particles into a rigid mass about the casting. Thereby all portions of the casting can be worked upon by faster cutting and more powerfully fed cutting tools.

3,660,950

METHOD OF CONTROLLING THE ACTUAL STOCK REMOVAL IN SURFACE BELT GRINDING

Hidehiko Takeyama; Kaneyoshi Miyasaka, both of Tokyo, and Shinichi Miyazawa, Kawasaki, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Apr. 6, 1970, Ser. No. 25,837
Claims priority, application Japan, Apr. 22, 1969, 44/31101
Int. Cl. B24b 1/00, 21/12
U.S. Cl. 51—328 2 Claims



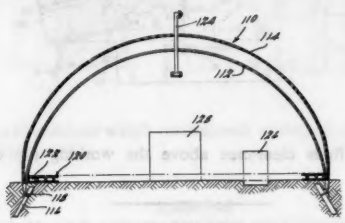
A method of controlling the actual stock removal in a method of belt grinding wherein the infeed and elasticity of a contact roll serve to increase the contact pressure of the abrasive belt, so as to obtain the required amount of stock removal irrespective of deterioration in the grinding performance of the belt due to repeated use and of the thickness of the workpiece.

3,660,951

SHOCK SHIELDING STRUCTURE AND METHOD

Sidney M. Cadwell, 436 Washington Road, Grosse Pointe, Mich.

Continuation-in-part of application Ser. No. 425,497, Jan. 14, 965, now abandoned. This application June 24, 1968, Ser. No. 739,351
Int. Cl. E04b 1/345
U.S. Cl. 52—2 17 Claims



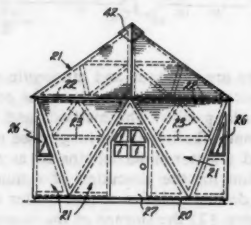
A shock shielding structure and method for shielding against shock by the use of inflated envelopes wherein said shielding is capable of functioning at peak reflected shocks of over 2,000 pounds per square inch to reduce the peak transmitted force by 70–90 percent or more. Still further, the shielding invention herein comprises a sheltering method and structure for use against the dangers incident to war and, more specifically, relates to a method or structure for use in shielding persons or equipment against the effects of nuclear explosion, and also toxic or corrosive gases and bacteria.

3,660,952

PREFABRICATED MODULAR BUILDING

Pryce Wilson, 2812 D. Street, Sacramento, Calif.

Continuation-in-part of application Ser. No. 671,707, Sept. 29, 1967. This application Feb. 19, 1970, Ser. No. 12,173
Int. Cl. E04b 1/32, 17/02
U.S. Cl. 52—81 9 Claims



A prefabricated modular building made from a plurality of panel members having the shape of an equilateral triangle and identical dimensions; and means for detachably fastening said panels together to form a building.

3,660,953

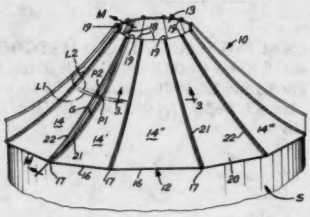
PRESTRESSED STRUCTURE

Robert E. Schenk, Waterloo, Iowa, assignor to Schenk Engineering Co.

Continuation-in-part of application Ser. No. 790,214, Jan. 10, 1969, now abandoned. This application May 18, 1970, Ser. No. 38,373
Int. Cl. E04b 7/10, 7/00
U.S. Cl. 52—82 13 Claims

In a prestressed structure for forming roofs or the like, a plurality of elongated curved members are arranged in side

by side relationship to each other, their opposite ends are attached to the corresponding ends of adjacent members and their longitudinal edges are spaced from each other to define



a gap. The curvature of the members is reduced by drawing the adjacent spaced edges of the members together so as to close the gap to effect prestress forces in said members.

3,660,954

FACING FOR BUILDING BLOCKS

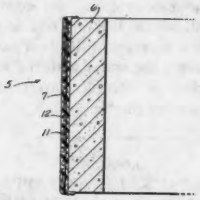
Raymond Logan, Farmers Branch, Tex., assignor to Broadway Finance Corporation, Milwaukee, Wis.

Original application Nov. 15, 1968, Ser. No. 815,507, now Patent No. 3,518,342. Divided and this application June 1, 1970, Ser. No. 42,130

Filed under Rule 47B

Int. Cl. E04c *2/20*

U.S. Cl. 52—309 **2 Claims**



A light weight shallow pan-shaped facing cap for concrete building blocks, formed of fiberglass-reinforced polymerized thermosetting resin with appearance producing particles of marble or granite dispersed therein beneath the outer surface of the cap.

3,660,955

STRUCTURE FOR PROVIDING AIR CIRCULATION AT THE ROOF OF A BUILDING

Hans Simon, Bruchhausener Strasse 5463, Unkel/Rhine, Germany

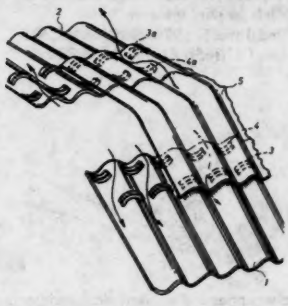
Filed Apr. 17, 1970, Ser. No. 29,496

Claims priority, application Germany, Sept. 30, 1969, P 19 49 217.2

Int. Cl. E04d *1/06, 3/36, 3/40*

U.S. Cl. 52—420 **8 Claims**

A building having rows of overlapping shingles defining an air passage therebetween. The overlapping rows of shingles include one longitudinal row having an outer edge region overlapping and situated outwardly of an inner edge region of an adjoining row of shingles with these shingle rows respectively having overlapping surface areas directed toward each other. Rows of spacers are situated between these overlapping surface areas to maintain them spaced from each other, and the spacers of one row are staggered with respect to the spacers of the other row with all of these rows extending horizontally. Thus, while air can blow between the rows of spacers and thus between the overlapping surface areas of the shingles, a liquid such as rain cannot progress therebetween.



3,660,956

GRATING CONSTRUCTION

Oscar A. Budlong, Santa Ana, Calif., assignor to Brooks Products, Inc., El Monte, Calif.

Filed June 29, 1970, Ser. No. 50,526

Int. Cl. E01c *9/10*

U.S. Cl. 52—669 **4 Claims**

A grating construction in which the grating members include upper portions defining vertical slots and lower portions defining angular slots, the spacing being such that any particle having a width and length less than the spacing of the upper portions will pass through the lower portions; however, the angular relation between the upper and lower portions prevents passage of an elongated member therethrough.

3,660,957

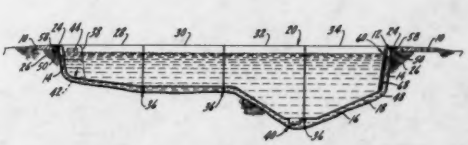
PREFABRICATED SWIMMING POOL CONSTRUCTION

Martin M. Schankler, 12 New Dover Road, E. Brunswick, N.J.

Continuation-in-part of application Ser. No. 591,365, Oct. 10, 1966. This application Dec. 10, 1968, Ser. No. 782,668

Int. Cl. E04b *1/41;* **E04g** *21/00*

U.S. Cl. 52—742 **4 Claims**



The apparatus and method for building a prefabricated swimming pool in which a flexible liner is placed within an excavated hole and a rigid shell suspended from a peripheral walk around the excavation is spaced from the outer liner to define a water cavity. In one form the cavity is sealed from water within the rigid shell, and in another form means are provided for circulation of water from the shell to the cavity, ad from the cavity to a pump and filter where it is directed back to the shell.

3,660,958

PROTECTIVE WRAPPER FOR ROLL OF SHEET MATERIAL AND METHOD OF MAKING SAME

Donald R. Garrison, Warren, Mich., assignor to Vito Guida, Centerline, Mich., a part interest

Filed June 1, 1970, Ser. No. 42,303
Int. Cl. B65b *11/00;* **B65d** *85/66*
U.S. Cl. 53—3 **1 Claim**

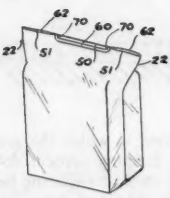
A protective wrapper for a cylindrical article such as a roll of sheet material, or the like, which includes at least one sheet of corrugated material to protect the cylindrical article during shipment and storage and during handling operations.

3,660,959

METHOD OF FORMING PRODUCT-FILLED BAG

Arthur E. La Fleur, 273 River Street, Manistee, Mich.

Filed Mar. 31, 1970, Ser. No. 24,133
Int. Cl. B65b *61/17, 67/12;* **B65d** *33/10*
U.S. Cl. 53—14 **10 Claims**



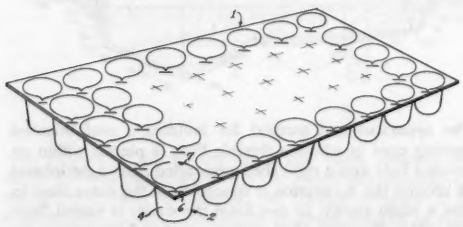
A commodity bag formed of a thermoplastic material, such as polyethylene, provided with gussets along each side and with reinforcing seams at the bottom to impart a square bottom to the bag when opened and which, after being filled with a commodity, has the central portion of its upper edges sealed together to form a handle for the bag.

3,660,960

METHOD OF MAKING A PACKAGE

Richard B. Inman, Dunwoody, Ga.

Filed Apr. 24, 1970, Ser. No. 31,725
Int. Cl. B65b *3/04, 61/02*
U.S. Cl. 53—14 **2 Claims**



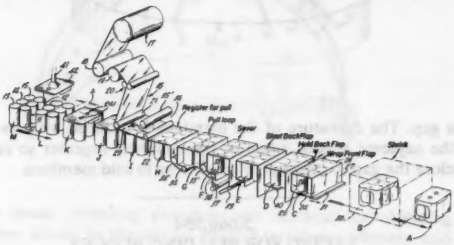
A method of making individual serving packages in which a sheet is sealed around the rims of a plurality of cups formed in a single sheet. After sealing, the cups are cut away from the sheet with the cover sheet sealed to them. The initial sheet containing the cups has a slit which causes a tab to be formed when the completed packages are severed from the sheet.

3,660,961

PACKAGING MACHINE AND METHOD

Robert H. Ganz, 8 Ridge Crest Road, Saddle River, N.J.

Filed June 22, 1970, Ser. No. 47,996
Int. Cl. B65b *11/10, 35/44, 49/10*
U.S. Cl. 53—26 **40 Claims**



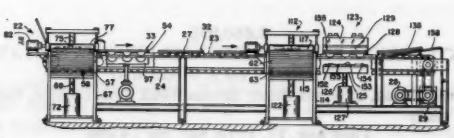
The invention contemplates method and apparatus for the rapid and efficient packaging of clusters of articles, such as beverage containers, with a wrapping such as shrinkable plastic film or sheet. The containers are received at one end of a production line in random succession, are converted into groups or clusters appropriate for packaging, with the maximum dimension of the cluster transverse to the direction of conveyor movement. The clusters are then, in the course of their continuous movement along the conveyor, enveloped with sheet material which is paid out in the longitudinal direction of conveyor movement. In final passage of the conveyor through an oven, the sheet material is adhered to bind the envelopment and is shrunk into tensed limited conformance with the cluster profile.

3,660,962

SHRINK FILM PACKAGE, AND APPARATUS AND METHOD FOR MAKING SAME

Richard T. Bliss, and George L. Nason, both of Andover, Mass., assignors to Bliss-Pack, Inc., Lawrence, Mass.

Filed Oct. 13, 1969, Ser. No. 865,829
Int. Cl. B65b *47/02, 53/02*
U.S. Cl. 53—30 **19 Claims**



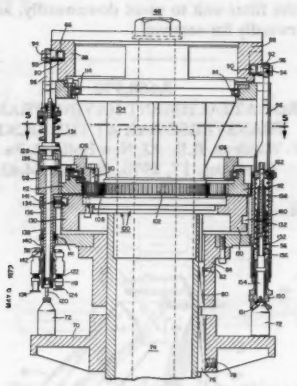
A plastic shrink film package formed of two peripherally heat-bonded films and at least one windowed backer sheet is produced at high speed by being formed of two separate sheets, rather than from a single folded sheet, at least one sheet having multiple windows, the pressure forming die having multiple recesses and the heating plate having multiple heat seal elements. A perforated line is formed inside the heat seal of each individual package during or after the heating step, each pocket is stretched to the full extent of the female die during the pressure step, and each pocket is punctured to form an air outlet orifice at the end of each pressure step.

3,660,963

CONTAINER CLOSING APPARATUS AND METHOD

Edward F. Sullivan, Baltimore, Md., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed May 28, 1970, Ser. No. 41,283
Int. Cl. B65b 7/28, 59/04
U.S. Cl. 53—42 13 Claims



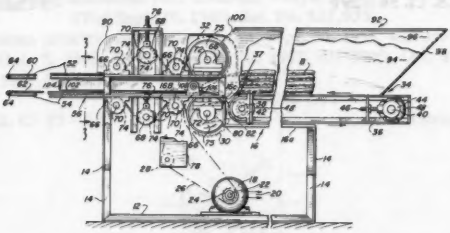
Separable infeed, filling, drive, and closing modules are provided for filling and closing bottles and cans. When bottles are filled and closed, the closing module includes a turret having interchangeable roll-on cap applying heads or crown applying heads. When cans are filled and closed, the closing module includes a seamer.

3,660,964

MATERIAL GUIDE MEMBERS FOR A COMPRESSING AND CONVEYING APPARATUS

Arnold L. Willis, Chicago, and Harold Wortman, Morton Grove, both of Ill., assignors to MSL Industries, Inc.

Filed July 24, 1969, Ser. No. 844,348
Int. Cl. B65b 1/24, 63/02, 27/12
U.S. Cl. 53—125 1 Claim



An apparatus having parallel, spaced apart belt conveyors and a hopper used in conjunction therewith and provided with a pair of flexible spaced apart material guide members positioned inwardly of and adjacent to the lateral edges of the belt conveyors to prevent material being conveyed by the conveyors from becoming entangled therewith.

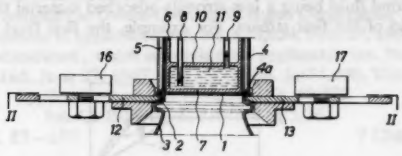
3,660,965

APPARATUS FOR SEALING UPPER CLOSURE COVERS OF CONTAINERS

Jose Coloma Morera, Barcelona, Spain, assignor to Alimentas Ibericos S.A., Barcelona, Spain

Filed Sept. 8, 1969, Ser. No. 856,014
Claims priority, application Spain, Sept. 19, 1968, 358,578
Int. Cl. B65b 7/28
U.S. Cl. 53—329 5 Claims

A method of and apparatus for sealing containers for food products, comprising the steps of and means, respectively, simultaneously effecting the sealing of the peripheral zone of the cover on a corresponding flange of the neck of the container and effectively cooling the remainder of the surface of the closure cover, to obtain a pore-free hermetically tight closure.

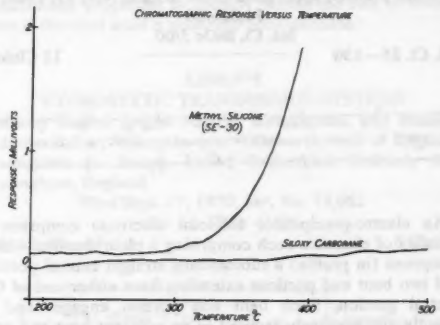


3,660,966

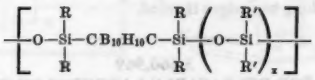
METHOD OF CHROMATOGRAPHIC ANALYSIS USING SILOXY CARBORANYL PARTITIONING PHASES

Richard w. Finch, Northford, and Willard Alan Nichols, Madison, both of Conn., assignors to Olin Corporation

Continuation-in-part of application Ser. No. 879,696, Nov. 25, 1969, now abandoned. This application Aug. 10, 1970, Ser. No. 62,624
Int. Cl. B01d 15/08
U.S. Cl. 55—67 8 Claims



Vapor phase chromatography wherein a siloxy carboranyl liquid partitioning phase having recurring structural units of the following formula is used:



where each R and R′ substituent is an independently selected alkyl group of one to eight carbon atoms or aryl group of up to 10 carbon atoms and x is 1 to 5. These siloxy carboranyl partitioning phases are particularly useful at high temperatures.

3,660,967

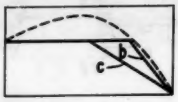
PURIFICATION OF FLUID STREAMS BY SELECTIVE ADSORPTION

John J. Collins, Katonah; Stephen A. Conviser, Pelham; Richard A. Anderson, Katonah, and Krishan D. Manchanda, Scarsdale, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 8, 1970, Ser. No. 70,052
Int. Cl. B01d 53/02
U.S. Cl. 55—73 9 Claims

Zeolitic molecular sieve adsorption beds are employed with greatly enhanced efficiency in fluid stream purification

operations by using a bed to selectively adsorb impurities from a first fluid stream and without regeneration of the bed passing a second impure fluid stream therethrough, the second fluid being a less strongly adsorbed material than the fluid of the first stream. For example, the first fluid stream



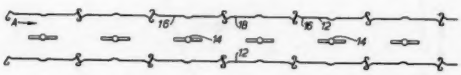
can be an olefin stream containing sulfur compound impurities and the second a paraffin stream also containing sulfur compound impurities. When used in this manner, the bed exhibits a higher capacity for the impurities adsorption than would be predicted from the impurity adsorption loading from the individual streams.

3,660,968

ELECTRO-PRECIPITATORS

John F. Dyla, Birmingham, and Robin A. Attfield, Great Wyrley, both of England, assignors to Lodge-Cottrell, Limited, Birmingham, England

Filed Nov. 10, 1969, Ser. No. 875,396
Claims priority, application Great Britain, Nov. 19, 1968, 54,816/68
Int. Cl. B03c *3/00*
U.S. Cl. 55—130 **11 Claims**



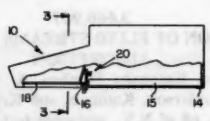
An electro-precipitator collector electrode comprises a plurality of elements each comprising a plate member which comprises (in profile) a substantially straight central portion and two bent end portions extending from either end of the central portion. Each bent end portion engages and is directly and positively secured to an adjacent bent end portion of an adjacent element, and each bent end portion comprises a surface which (in profile) is generally inclined at an angle greater than 90° to said central portion and engages a corresponding surface of the said adjacent bent end portion; this angle of the surface facilitates access of a fastening tool during erection. Adjacent collector electrodes are braced together along top edges thereof.

3,660,969

DEVICE FOR RELEASABLY LATCHING FILTERS AND LAMP LENSES IN RANGE HOODS

Norman P. Fox, Springwater, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,691
Int. Cl. B01d *27/08*
U.S. Cl. 55—385 **2 Claims**



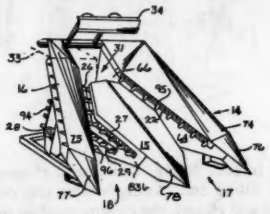
A removable filter unit is mounted in a range hood to pivot about its rear edge into an operative position rearwardly of a removable light lens, and beneath the hood's exhaust fan. A finger-actuatable latch is pivoted on the forward edge of the filter unit, and has a slot in its upper end engageable over a stationary pin in the hood to secure the unit in its operative position, at which time a flange on the forward edge of the unit engages and clamps the rear edge of the light lens against the hood also to lock the lens in place. The lower end of the latch is manually actuatable to pivot the latch to released position to disengage its slot from said pin, thereby to permit the filter unit to pivot downwardly, and the lens to be slid rearwardly for removal.

3,660,970

ROW CROP ATTACHMENT HAVING FRAME WITH A TRANSVERSE BAR AT THE SICKLE

Thomas W. Waldrop, R.D. #2, New Holland, Pa.

Filed Aug. 17, 1970, Ser. No. 64,431
Int. Cl. A01d *45/02*
U.S. Cl. 56—98 **5 Claims**



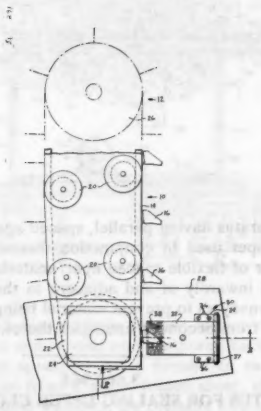
A two row crop attachment has rectangular shape bar between the base frame and lower forwardly extending frames to stiffen the frames for supporting the sickle with a minimum of misalignment.

3,660,971

MOWER BLADE SHARPENING MEANS

Joseph C. Hurlburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 24, 1970, Ser. No. 66,430
Int. Cl. A01d *55/24*
U.S. Cl. 56—291 **3 Claims**



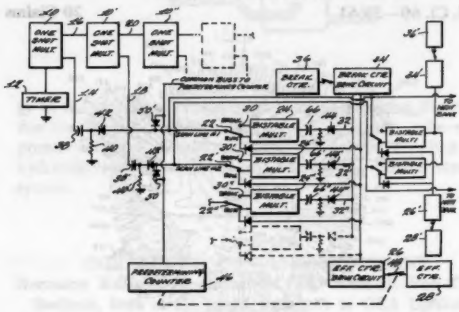
A mower having a sharpening abrasive member for engagement by the cutting blades of the mower during movement of the blades in operation, the abrasive member being mounted so as to permit adjustment to orient the operative face of the abrasive member with the surfaces of the blades to be abraded to sharpen the cutting edges.

3,660,972

OPERATION MONITORING SYSTEM

Henry R. Neill, Clarksville, and Robert G. Davies, Boydton, Va., assignors to Burlington Industries Inc., Greensboro, N.C.

Filed Jan. 9, 1970, Ser. No. 1,814
Int. Cl. D01h *13/14*
U.S. Cl. 57—34 R 7 Claims



An operation monitoring system which may be adapted for use to monitor numerous types of operations and which is applicable to the monitoring of multi-spindle textile winding operations. The system is adapted to determine the efficiency of the operation and to count the number of unscheduled events which occur, such as yarn breaks in the multi-spindle textile winding operation. Scan pulse providing means produce a series of pulses which are registered by an efficiency counter when the operation is proceeding in a normal manner and a second counter registers the number of unscheduled events or yarn breaks which occur.

3,660,973

SPUN YARN AND A METHOD FOR MANUFACTURING THE SAME

Kozo Susami; Keiichi Minami; Masaaki Tabata; Teiryo Kojima, and Zyuji Yunoki, all of Otsu-shi, Japan, assignors to Toray Industries Inc., Chuo-ku, Tokyo, Japan

Filed Sept. 29, 1969, Ser. No. 861,933
Claims priority, application Japan, Sept. 30, 1968, 43/70191; Oct. 7, 1968, 43/72445; Oct. 11, 1968, 43/73500; Oct. 21, 1968, 43/76134; Oct. 22, 1968, 43/76511
Int. Cl. D02g *3/02*; D01h *1/12*
U.S. Cl. 57—139 6 Claims

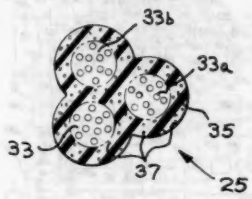
A spun yarn having a particular internal configuration wherein the number of twists of the outer fibrous layer is different from that of the inner fibrous layer, spiral diameter of fibers composing the yarn is almost identical, unevenness index does not exceed 10 and variation coefficient of stretching tension is smaller than 4. In the manufacturing method, a particular relationship is established between the configurational feature of the supplied fiber bundle and the mechanical conditioning of the system.

3,660,974

INDUSTRIAL BELT CONSTRUCTION

Alfred Marzocchi, and Albert J. Garbin, both of Cumberland, R.I., assignors to Owens-Corning Fiberglas Corporation

Continuation of application Ser. No. 828,034, Feb. 27, 1969, now abandoned, which is a division of application Ser. No. 649,165, June 27, 1967, now Patent No. 3,474,400. This application Aug. 31, 1970, Ser. No. 68,523
Int. Cl. D02g *3/36, 3/44*; F16g *5/16*
U.S. Cl. 57—153 7 Claims



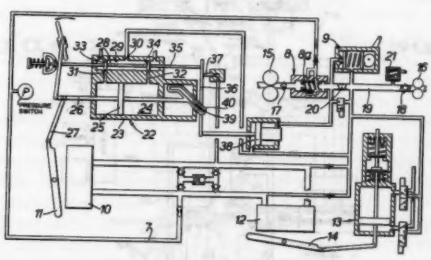
An industrial drive belt (V-belt) construction featuring an interior reinforcement in the form of a continuous cord extending longitudinally of the belt in repeated spiral wraps through the belt; the cord bearing a sheath or coating of cushion-like properties to thereby permit the belt to stretch even if the cord itself is relatively nonextensible.

3,660,975

HYDROSTATIC TRANSMISSION SYSTEMS

Anthony Eugene Joseph Martin, Birmingham, and Bernard James Baker, Wilnecote, near Tamworth, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 17, 1970, Ser. No. 73,062
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 5 Claims



An hydrostatic transmission in which there is provided an automatic pump displacement control, a manual override device for overriding the displacement control to keep the pump displacement at a low level, and a device sensitive to pump inlet pressure to render the override device inoperative when the pump inlet pressure exceeds a predetermined value.

3,660,976

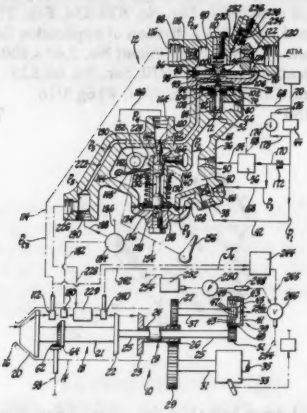
TURBINE ENGINE CYCLE TEMPERATURE CONTROL SYSTEM

Raymond P. Canale, Warren, Mich., assignor to Holley Carburetor Company, Warren, Mich.

Filed Apr. 20, 1970, Ser. No. 29,864
Int. Cl. F02c *7/02*
U.S. Cl. 60—39.16 13 Claims

A turbine engine, provided with a fuel control, has a gasifier section and a free turbine power section with energizeable

clutching means adapted for at least at times causing frictional engagement between the sections in order to vary the



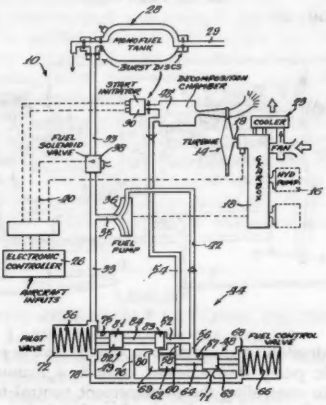
then existing temperature within a selected point of the engine to cause that temperature to change to a value consistent with prescribed limits for that temperature.

3,660,977

EMERGENCY HYDRAULIC POWER SYSTEM

Richard W. Reynolds, Rockford, Ill., assignor to Sundstrand Corporation

Filed Mar. 5, 1970, Ser. No. 16,841
Int. Cl. F02c 9/08, 9/10
U.S. Cl. 60—39.28 **10 Claims**



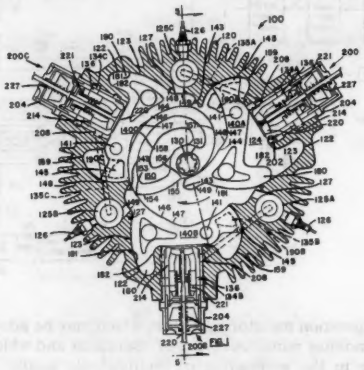
An emergency hydraulic power system for providing emergency hydraulic supply to an aircraft including a turbine driving a variable displacement pump through a gear box with a speed control to maintain a substantially constant turbine speed consisting of a centrifugal fuel pump that is driven at turbine speed for supplying a monopropellant fuel to a decomposition chamber, a bistable fuel control valve in the outlet of the fuel pump that is operated by a fuel pressure responsive pilot valve that closes the normally open fuel control valve when outlet pressure from the fuel pump exceeds a predetermined value indicating turbine overspeed, and opens the fuel control valve when the outlet pressure from the fuel pump drops below a predetermined value indicating turbine underspeed.

3,660,978

INTERNAL COMBUSTION ENGINE

John N. Hinckley, Beloit, Wis., assignor to Beloit College, Beloit, Wis.

Filed Sept. 24, 1969, Ser. No. 870,331
Int. Cl. F02c 5/00, 5/12
U.S. Cl. 60—39.61 **20 Claims**



A rotary internal combustion engine having a plurality of swinging arms spaced uniformly in a rotor housing and a rotor on a power output shaft adapted to engage the arms in said housing and thereby control the cycle of outward compression and exhaust strokes, and inward power strokes of each of said arms. Each arm includes an outwardly tapered, wedge-shaped horn member engageable within a recess provided in the adjacent engine housing to define an expandable compression chamber between said housing and each arm and to permit said arms to move freely between said inward and outward positions. In the preferred arrangement, the arms and rotor can shift laterally within the housing to positions of equilibrium, and the side portions of said arms and rotor include a plurality of labyrinth grooves in sealing relationship with respect to the rotor housing. Spherical combustion chambers in the housing adjacent the free end of each of said arms communicate with the interior of said housing and are adapted to direct an expanding charge of combustion gases against said arms and the exposed portion of the rotor. Said rotor and arms can be adapted to cause substantially complete combustion of the gas charges within the combustion chambers prior to expansion of the charges in said rotor housing. Exhaust ports provided in said housing selectively exhaust spent combustion gases from the interior of said housing, and a cam startup system is adapted to initiate the cycle of operation for the arms. The rotor may be adapted so that each arm will transmit a plurality of power impulses to the rotor for each complete rotor revolution, and further to overlap the power impulses of adjacent arms during the engine operation.

3,660,979

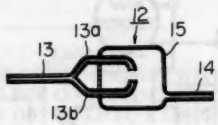
METHOD AND DEVICE FOR DAMPING FLOW PULSATIONS IN A HYDRAULIC SYSTEM

Satoru Kamakura, and Yukio Watanabe, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Apr. 1, 1970, Ser. No. 24,481
Int. Cl. F16l 55/04
U.S. Cl. 60—52 **4 Claims**

A method and device for damping flow pulsations in a liquid-phase flow supplied under pressure from a conven-

tional hydraulic pump or the like, which method comprises dividing the supplied pulsating flow into two separate flow components, causing the flow components to impinge upon each other in an enclosure so as to cancel the pulsating energy in the two flow components, and withdrawing the pulsation-free pressurized flow out of the enclosure, whereby a pressurized flow cleared of pulsations can be supplied to a hydraulic system such as an automotive power steering system.

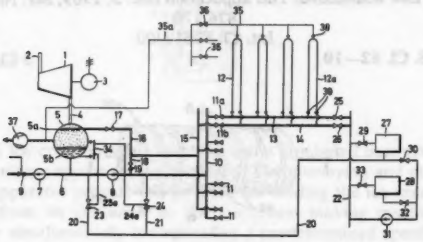


3,660,980

INDIRECT AIR CONDENSATION PLANT

Hermann Knirsch, Wattenscheid, and Hans-H. Von Cleve, Bochum, both of Germany, assignors to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG, Bochum, Germany

Filed May 13, 1970, Ser. No. 36,849
Claims priority, application Germany, May 17, 1969, P 19 25 234.7
Int. Cl. F01k *9/00*
U.S. Cl. 60—95 R **21 Claims**



A condensation plant for condensing superheated steam and the like, having a jet condenser for condensing the steam and a plurality of air-cooled cooling elements to feed cooling water to the condenser and to cool the condensate. Distribution means, including pumps and valves, are provided between the condenser and cooling elements which allow for the selective flow of the condensate and drainage of any individual portion of the plant. A vacuum line is included in the distribution means and is connected to the highest point of each cooling element. The pressure in the vacuum line is below atmospheric pressure and only slightly above the specific saturation pressure of the condensate corresponding to the water temperature in the upper part of the cooling elements. The vacuum line, along with providing a control function, also enables replacement of a single cooling element without shutting down the entire plant.

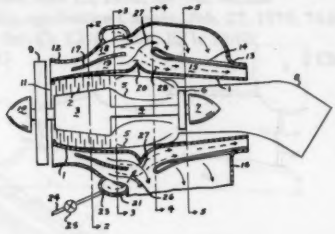
3,660,981

THE S/TOL AIRCRAFT

Emerson W. Stevens, Snyder, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 5, 1970, Ser. No. 77,776
Int. Cl. F02k *1/20, 3/06*
U.S. Cl. 60—226 R **5 Claims**

The invention concerns a turbo fan engine and in which the output of the fan can be normally directed downwardly to lift the aircraft from the ground, or optionally, can be caused to shift into a horizontal direction and thus augment the normal thrust of the engine. It has particular application to the so-called "vertical short takeoff and landing" type of aircraft. The fan is located forward of the engine and the movement of the air which is in excess of that furnished to the compressor in changed as to direction from the vertical to the horizontal by causing a jet of high pressure air, obtained from a source exterior of the fan, bodily to shift or divert the air column emanating from the fan traveling in the downward vertical direction to now travel in the horizontal direction after the plane has attained its proper height in space. The diverting jet of high pressure air is discharged from an annular opening in a chamber of ring-like character which surrounds the engine and to which the source of high pressure air, preferably taken from the compressor, is applied.

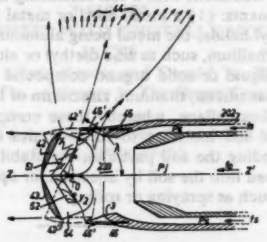


3,660,982

NON-RETURN DEVICE FOR FLUID DUCTS AND THRUST REVERSERS

Albert Gozlan, Asnieres, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, Seine, France

Filed Mar. 3, 1970, Ser. No. 16,042
Claims priority, application France, Apr. 28, 1969, 6925798; Dec. 30, 1969, 6945547
Int. Cl. F02k *1/24*
U.S. Cl. 60—230 **19 Claims**



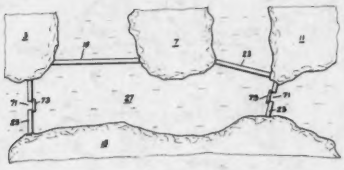
An ejector of the deflected flow type, including a primary duct and a secondary duct, the pressure in the primary duct being higher than that in the secondary duct, the secondary and primary flows being mixed on exit from a common throat-section, the mixture being deflected by a wall opposed transversely to the general direction of the two ducts, within at least one outlet means and in a plane of symmetry of the ejector, at least two non-return deflectors being provided on either side of said plane of symmetry, adjacent lateral walls of the ejector and in the return path of the primary flow deflected by said wall, whereby to deflect in a downstream direction those backflowing streams of said primary flow which are located laterally in relation to the outlet means and which would tend to flow back into said secondary duct, thus avoiding exagerate heating of the ducts.

3,660,983

APPARATUS AND METHOD FOR THE PREVENTION OF ICE IN WATERWAYS

George W. Gill, Wesher Villa, Apt. #71, Webster, Tex.

Filed Sept. 24, 1969, Ser. No. 860,536
Int. Cl. E02b 3/00, 5/04, 15/02
U.S. Cl. 61—1 8 Claims



The apparatus and method for enclosing bodies of water and for treating said water with chemical agents in order to lower the freezing point thereof and thus maintain the body of water free of ice so as to permit the movement of ships therethrough. The apparatus consists of a plurality of dams constructed of ice extending in such manner as to form a waterway. The dams of ice confine the chemically treated water and restrict escape of the treated water due to natural currents. Gate means are provided within the dam structure so as to provide for the ingress and egress of ships.

3,660,984

STABILIZING SOILS

Amos R. Anderson, Adrian, Mich., assignor to Joseph J. Packo

Filed July 10, 1970, Ser. No. 54,012
Int. Cl. E02d 3/14
U.S. Cl. 61—36 R 19 Claims

Unstable and permeable soils are stabilized or solidified by a chemical treatment with a soil-stabilizing agent comprising two components: (1) a metal alkyl or metal alkyl hydride or a metal alkyl halide, the metal being aluminum, zinc, indium, gallium or thallium, such as zinc diethyl or aluminum triethyl, and (2) a liquid or solid organo compound of a tetravalent metal such as silicon, titanium, zirconium or hafnium, such as an alkyl alkoxy silane, whereby these components react in presence of soil moisture to form in situ a solid reaction product binding the soil particles; the stabilizing agent may be introduced into the soil by injection, or applied by surface treatment such as spraying or rolling.

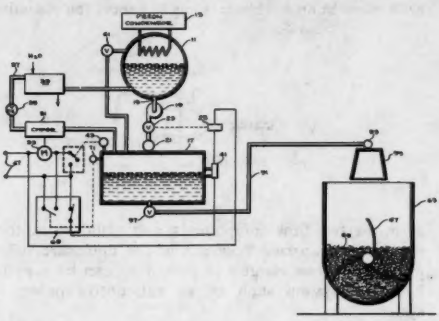
3,660,985

METHOD AND SYSTEM FOR MAKING CARBON DIOXIDE SNOW

Lewis Tyree, Jr., 10401 South Oakley Avenue, Chicago, Ill.

Filed Feb. 26, 1970, Ser. No. 14,525
Int. Cl. F25i 1/00
U.S. Cl. 62—10 10 Claims

A system for making particulate solid CO_2 using a storage vessel holding liquid CO_2 at high pressure, a tank connected to the storage vessel and expansion means for expanding the high pressure liquid to lower pressure, lower temperature liquid plus vapor at the tank. The passage of liquid through the expansion means is controlled to obtain a desired reservoir of low temperature liquid in the tank. A compressor withdraws vapor from the tank and returns the compressed vapor to the storage vessel. Snow expansion means is connected to the tank. When snow formation is desired, the reservoir of liquid CO_2 in the tank is suitably raised to a high pressure, as by connecting it to the vapor in the storage vessel, and the pressurized liquid CO_2 from the tank is supplied to the snow expansion means.

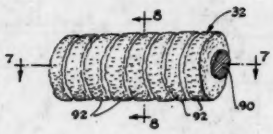


3,660,986

SOLIDIFIED GAS PELLETS

Robert C. Hardt, Chicago Heights, and Edward Kozlow, Homewood, both of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Continuation of application Ser. No. 660,790, Aug. 15, 1967, now abandoned. This application Dec. 3, 1969, Ser. No. 876,170
Int. Cl. F25j 1/00
U.S. Cl. 62—10 5 Claims



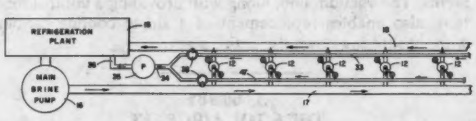
Carbon dioxide pellets of a high density formed in a manner to break easily into minute pieces yet not agglomerate during shipment, together with a head member for a pellet machine to form pellets of this kind.

3,660,987

FREEZE HOLE AIR BLEEDER SYSTEM

Charles P. Gail, San Clemente, Calif.; Ugo Serra Zanetti, New York, and Andrew L. Amisano, Woodside, both of N.Y., assignors to Poirier & McLane Corporation, Yonkers, N.Y.

Filed June 22, 1970, Ser. No. 48,273
Int. Cl. F25d 17/02; F25i 43/00
U.S. Cl. 62—230 14 Claims



An arrangement for removing occluded air in a refrigerated liquid circulated through a plurality of freezing elements used in solidifying incompetent earth formations, which includes bleed lines extending from the freezing elements to manifolds positioned above the freezing elements, a valve in each bleed line controlling the flow to allow air and

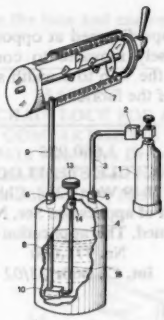
a minor amount of said liquid to be conducted therethrough, the manifold sloping downwardly to the inlet of a pump that returns the liquid from the manifold to the refrigeration plant, and float-operated vent devices connected to and positioned above the manifolds for collecting and discharging the air.

3,660,988

CONTAINER FOR COMBINING GAS WITH A LIQUID MIXTURE AND FOR CONVEYING THE MIXTURE THEREBY OBTAINED TO A MACHINE, PARTICULARLY FOR USE IN ICE CREAM MAKING MACHINES

Giancarlo Garavelli, Milan, Italy, assignor to Heron Establishment, Vaduz, Liechtenstein

Filed Sept. 22, 1969, Ser. No. 859,749
Claims priority, application Italy, Sept. 24, 1968, 39973 A/68
Int. Cl. F25c *7/14*
U.S. Cl. 62—306 **2 Claims**



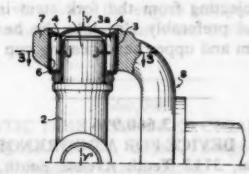
An ice cream making machine and a combined conveying and mixing apparatus are disclosed. The conveying and mixing apparatus provide the pressure for feeding the ice cream mix from its container to the ice cream making machine while simultaneously incorporating a predetermined specific gas ratio into the mix so as to produce the desired gas mix ratio in a complete ice cream.

3,660,989

UNIVERSAL JOINT

Alfred Pitner, Paris, France, assignor to Nadella, a part interest

Filed Dec. 8, 1969, Ser. No. 883,147
Claims priority, application France, Jan. 24, 1969, 6901314
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 **2 Claims**



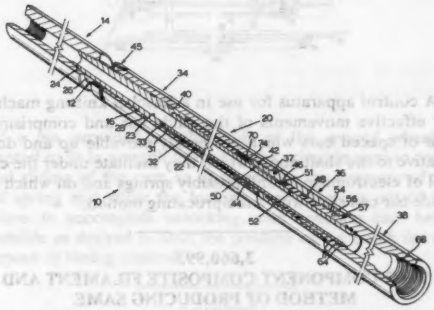
Universal joint in which the needle bearing cup surrounding each trunnion of the cross member of the joint has a non-circular cross-sectional shape so that the passage for the needles is smaller in the zones in which the forces are transmitted by the joint than in the rest of the passage for the needles. This is achieved by an interaction between the branch of the material of the yoke surrounding the bore and the cup which deforms the cup in the desired manner. A method is disclosed for achieving this result.

3,660,990

VIBRATION DAMPER

Donald L. Zerb, 4323 1117th Street, and William M. Varty, 11634 133rd Street, both of Edmonton, Alberta, Canada

Filed June 15, 1970, Ser. No. 46,324
Claims priority, application Canada, Feb. 27, 1970, 76,040
Int. Cl. E21b *17/04*; E21c *15/00*
U.S. Cl. 64—23 **2 Claims**



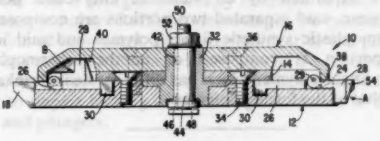
An improved vibration damper for drill bits of the type used in drilling into the earth for oil and gas. The damper includes a rigid metallic sleeve slidably housed in splines formed in an outer casing assembly. The sleeve is free to move longitudinally in the casing assembly and torque is transmitted by the splines. A rubber bush is housed in the outer casing such than when the drill bit receives a longitudinal shock the sleeve moves into the casing assembly and the rubber bush is deformed to absorb the shock.

3,660,991

PATTERN WHEEL WITH PIVOTALLY MOUNTED JACKS

Lester Mishcon, Miami Beach, and Donald W. Reagan, Hialeah, both of Fla., assignors to The Singer Company, New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,268
Int. Cl. D04b *15/76*
U.S. Cl. 66—50 A **3 Claims**



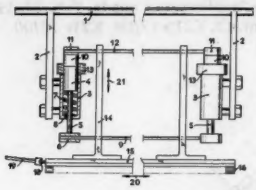
A pattern wheel for a circular knitting machine is provided with pivotally mounted jacks capable of being moved about their pivotal mountings between needle-actuating positions and non-actuating positions, the pattern wheel also being provided with means effective to prevent dislodgement of the jacks from their needle-actuating positions when disposed over the jacks and secured to the wheel.

3,660,992

LOOMS

Augustin Perrier, Lyon, France, assignor to Manufactures Jean-Baptiste Martin, Jean Martin, Andre Charbin Cie, Lyon (Rhone), France

Filed Mar. 11, 1970, Ser. No. 18,587
Claims priority, application France, Mar. 17, 1969, 6906946
Int. Cl. D04b *23/00*
U.S. Cl. 66—86 4 Claims



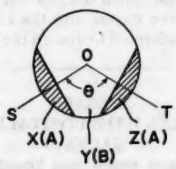
A control apparatus for use in a Raschel knitting machine for effective movements of the guide bar and comprising a pair of spaced bars which are bodily movable up and dow relative to the shaft about which they oscillate under the control of electromagnets and possibly springs and on which the guide bar can slide with a reciprocating motion.

3,660,993

TWO-COMPONENT COMPOSITE FILAMENT AND METHOD OF PRODUCING SAME

Masao Matsui, Takatsuki, and Susumu Tokura, Osaka, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan and Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Continuation of application Ser. No. 692,479, Dec. 21, 1967, now abandoned. This application Mar. 8, 1971, Ser. No. 122,188
Int. Cl. D04b *21/14, 9/46;* D02a *3/00*
U.S. Cl. 66—202 11 Claims



A two-component composite filament having an unbiased dyeability and a suppressed crimpability wherein three distinctly sectioned portions including respectively a part of the periphery of the unitary filament are disposed in a side-by-side relation and extends uniformly throughout the entire length of the filament, two portions among said three portions are separated by an adherent intervened portion therebetween, said separated two portions are composed of one thermoplastic synthetic linear polymer and said intervened portion is composed of another thermoplastic synthetic linear polymer which has different heat shrinkability from that of the former polymer.

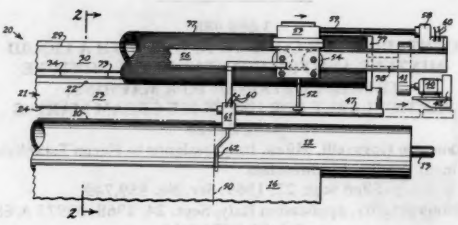
3,660,994

DYEING APPARATUS FOR CONTINUOUSLY MOVING WEB

Grover Z. Gowin, Tunnel Hill, Ga., assignor to Gowin-Card, Inc., Dalton, Ga.

Filed May 12, 1970, Ser. No. 36,566
Int. Cl. B05c *5/00, 9/06*
U.S. Cl. 68—205 R 5 Claims

A spill plate arranged to convey dye liquors upon the surface of a continuously and longitudinally moving web fabric, means feeding dye liquor continuously upon the spill plate, a slotted meter roll engaging the spill plate and driven at a uniform speed to feed uniform streams of dye liquor over the spill plate, guide cups disposed at opposite sides of the spill plate and transversely movable to confine the stream of liquor falling upon the web to a width substantially coinciding with the width of the fabric.

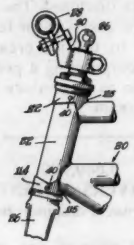


3,660,995

BICYCLE STEM LOCK

Frank F. Klein, Jr., 2049 West 63rd, Chicago, Ill.

Continuation-in-part of application Ser. No. 618,004, Feb. 23, 1967, now abandoned. This application Oct. 28, 1968, Ser. No. 771,080
Int. Cl. B60r *25/02*
U.S. Cl. 70—187 9 Claims



A bicycle fork stem lock installed either at the time of manufacture of a bicycle or subsequently, the lock including a slide bolt projecting from the fork stem into the upper bearing cup and preferably also into the head frame, the bicycle fork stem and upper head bearing cup being of standard size.

3,660,996

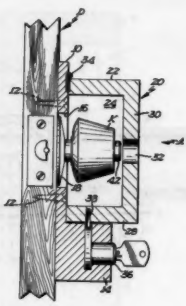
LOCKING DEVICE FOR A DOORKNOB LOCK

Albert Syvertson, 3112 Tenth Avenue South, Minneapolis, Minn.

Filed July 29, 1970, Ser. No. 59,278
Int. Cl. E05b *13/00*
U.S. Cl. 70—209 1 Claim

A locking device for a doorknob lock including a base, means for securing the base to a door, said base formed with an opening through which a doorknob extends, a cover, the cover having an access hole, means mounting said cover on

the base for displacement relative to the doorknob to allow access to the doorknob and means for locking the cover in a



secure position upon the base and enclosing the doorknob of a door.

3,660,997

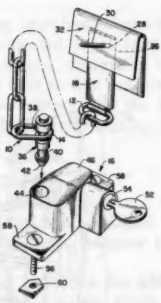
ANTI-THEFT CHAIN LOCK FOR AUTOMOBILE COMPARTMENTS

David N. Michnoff, 7416 West Park Drive, Hyattsville, Md.

Filed Jan. 9, 1970, Ser. No. 1,580

Int. Cl. E05b *65/19*; E05c *17/36*

U.S. Cl. 70—240 **2 Claims**



The engine compartment of an automobile is secured against unauthorized access by means of a chain lock including a universally flexible chain, one end of which is simply but securely attached to the hood of the automobile and the other end of which is detachably engaged with a key-operated locking mechanism simply and securely attached to a portion of the engine compartment. The entire chain lock is hidden from view when the engine compartment is closed but becomes immediately evident when normal hood latch is released.

3,660,998

AUTOMATIC TIME-UNLOCKED CIGARET CASE

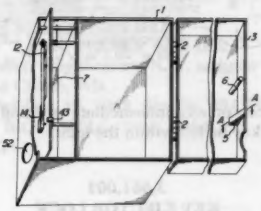
Yoshihiro Ishijima, Osaka, Japan, assignor to Sogawa Machineries & Supplies, Osaka, Japan

Filed Feb. 16, 1971, Ser. No. 115,624

Int. Cl. A24f *15/12*

U.S. Cl. 70—269 **1 Claim**

A timer-controlled cigaret case which is automatically unlocked after the lapse of a preset period of time, in which a push rod provided on the inner surface of the cover is adapted to press down turning arms pivotally supported inside the case body, thereby winding a flat spiral spring of a timer and starting the timer and bringing a locking pawl formed at the front end of a leaf spring into engagement with a locking groove of a projection from the cover so as to accomplish locking, said leaf spring being adapted to be pressed by a side surface of a criterion cam which is rotatably and slidably fitted to the shaft of a second wheel of the timer,



and a pin provided on the shaft of the second wheel is adapted to fit in a notch formed in the criterion cam to cause axial sliding of the cam so as to release the pressure of the leaf spring and allow the locking pawl to move out of the groove to accomplish unlocking, said criterion cam being rotatable as desired to shift the position of the notch for the purpose of timing control.

3,660,999

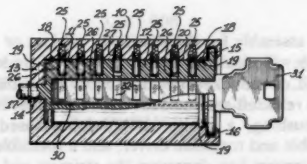
MAGNETICALLY OPERATED LOCKING MECHANISM

Henry Janzen, 172 College Street, Kingston, Ontario, Canada

Filed Oct. 22, 1970, Ser. No. 82,879

Int. Cl. E05b *27/00*, *47/00*

U.S. Cl. 70—276 **10 Claims**



A locking device comprises two members having meeting faces in substantial engagement with each other and a plurality of bores extending normally from each meeting face. The members are relatively movable to place each bore in one member in axial alignment with a bore in the other member. A tumbler is slidably mounted in each bore of one member and a plunger is slidably mounted in each bore of the other member. Resilient means urges the tumbler in one direction of movement. Either the tumbler or the plunger or both has magnetic characteristics. One of the members has a recess for reception of a key with magnetic sections which serve to impart locking or unlocking movement to the tumblers and plungers.

3,661,000

LOCK WITH UNIVERSAL KEY EJECTOR

William J. Kerr, Glenview, Ill., assignor to Chicago Lock Co., Chicago, Ill.

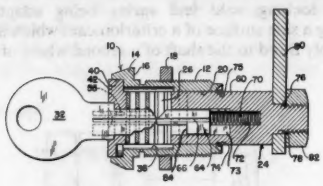
Filed June 12, 1970, Ser. No. 45,698

Int. Cl. E05b *17/00*

U.S. Cl. 70—388 **9 Claims**

A tumbler lock having associated therewith a spring-biased key ejector which is effective to eject the key in all angular

positions of the plug, i.e., in the unlocked position, the

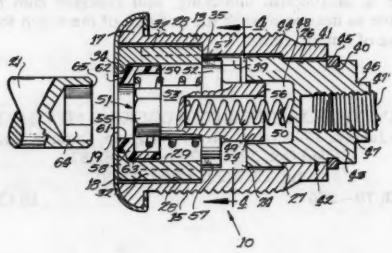


locked position, or any intermediate position so that at no time may the key be left within the lock.

3,661,001
KEY EJECTOR LOCK

Dwight W. Glass, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Aug. 3, 1970, Ser. No. 60,309
Int. Cl. E05b *17/00, 27/08*
U.S. Cl. 70—388 **11 Claims**



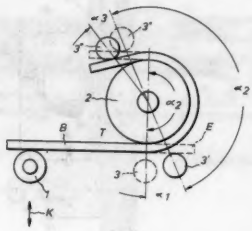
A lock assembly for the door of a cabinet or other enclosure which will eject the actuating key for the lock in either the locked or unlocked position or in any radial position if the key is released and includes a lock cylinder housing a stationary bushing, a reciprocable spring-biased stripper, a reciprocable and rotatable driver, and a rotatable plug. Insertion of a proper key depresses the stripper and reciprocates the driver from a first position in engagement with the bushing to a second position in engagement with the plug, thus freeing the driver from the bushing for rotation with the plug within the cylinder and relative to the bushing. The stripper will eject the key in any position of rotation of the driver.

3,661,002
BENDING MACHINE FOR BENDING REINFORCING IRONS FOR CONCRETE

Paul Ferd Peddinghaus, Jr., Gevelsberg, Germany, assignor to Paul Ferd Peddinghaus, Gevelsberg, Germany

Filed Oct. 5, 1970, Ser. No. 77,886
Claims priority, application Germany, Oct. 4, 1969, P 19 50 127.0
Int. Cl. B21b *37/08;* **B21d** *7/02*
U.S. Cl. 72—21 **5 Claims**

A bending machine for bending reinforcing iron rods for concrete, which includes electric control means for preselecting the bending angle of the bending dish or bending arm, in which each desired bending angle of the rod to be bent has associated therewith a setting potentiometer and all setting potentiometers are preceded by a dead angle advance potentiometer and by recoil potentiometers, said last mentioned two potentiometers which also may be combined to a unit being common to all of said setting potentiometers, while means are provided which are operable selectively to operatively connect any one of said setting potentiometers

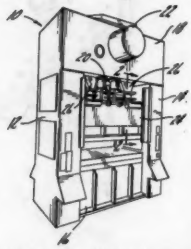


with said preceding dead angle advance potentiometer and said recoil potentiometer.

3,661,003
BLANKHOLDER PINCH INDICATOR SYSTEM FOR A POWER PRESS

Francis E. Helberger, Elmhurst, and Theodore F. Novak, Oakbrook, both of Ill., assignors to Danly Machine Corporation, Chicago, Ill.

Filed Apr. 13, 1970, Ser. No. 27,897
Int. Cl. B21c *51/00;* **B21d** *22/00*
U.S. Cl. 72—32 **5 Claims**



Blankholder pinch indicator system for a production power press where electrical or hydraulic means are utilized to sense the amount of clamping force applied at a number of positions about the edges of the workpiece being clamped thereby and visual indications of the clamping forces developed are produced at remote positions so that the press operator can maintain the proper amount of clamping force over successive press operating cycles.

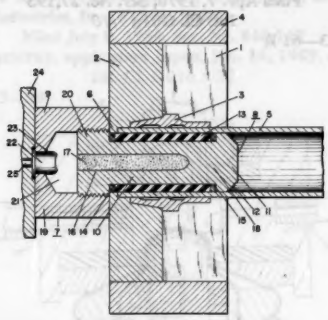
3,661,004
EXPLOSIVE TUBING SWAGER

John T. M. Lee, Phoenixville, and Donald P. Keathley, Glenmoore, both of Pa., assignors to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Nov. 7, 1969, Ser. No. 874,767
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 **14 Claims**

A non-rupturable spool and an explosive cartridge formed therewith useful for swaging tubing. An explosive charge is

contained within the spool and a transfer media, such as rubber, is placed over the spool to form the cartridge. The



cartridge is inserted into a tube and the charge is detonated which swages the tube against a sleeve or die.

3,661,005
METHOD FOR PRODUCING SEAMLESS TUBES WITH SMALL DIAMETERS

Ulrich Petersen, Dusseldorf; Ernst Von Chiari, Solingen, and Wilhelm Brutsch, Remscheid, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

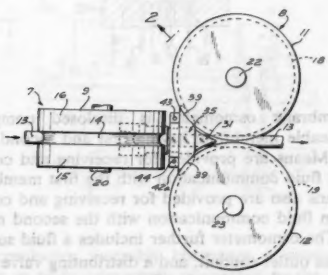
Filed Oct. 29, 1969, Ser. No. 872,373
Int. Cl. B21b *23/00*
U.S. Cl. 72—206 **3 Claims**

Method for producing seamless tubes of small diameter. The starting tube is subjected to at least one initial cold drawing over an interior tool, decreasing the diameter and the wall thickness of the tube so that the interior tube surface is brought into complete contact with the interior tool. The tube is then subjected to stretch reducing and to final cold drawing over an interior tool.

3,661,006
ROLLING MILL GUIDE

John A. Massara, Pueblo, Colo., assignor to C F & I Steel Corporation, Denver, Colo.

Filed Sept. 18, 1969, Ser. No. 858,945
Int. Cl. B21b *41/00, 39/20*
U.S. Cl. 72—227 **8 Claims**



A guide for directing the work from one set of shape rolls to the next is constructed to be supported at its opposite ends by the pairs of rolls constituting the successive passes or sets. The guide is specially shaped at each end and is provided near the rear end with a collar which engages the surfaces of the two rolls of the succeeding set. This collar is mounted in a fixed but adjustable position so as to cause the surfaces of the guide at the front end to engage the cylindrical surfaces of the two rolls forming the immediately preceding set.

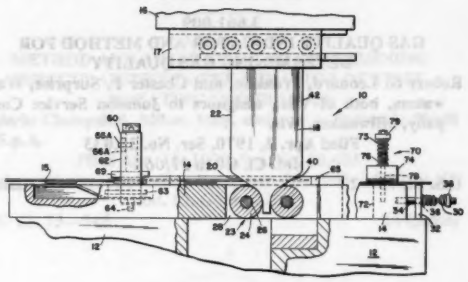
ERRATUM

For Class 72—419 see:
Patent No. 3,661,029

3,661,007
CAM FEEDER AND DIE

Frank R. Benedict, Brightwaters, N.Y., assignor to The Trane Company, La Crosse, Wis.

Filed Dec. 11, 1969, Ser. No. 884,238
Int. Cl. B21d *43/02;* **B26d** *5/20*
U.S. Cl. 72—421 **4 Claims**

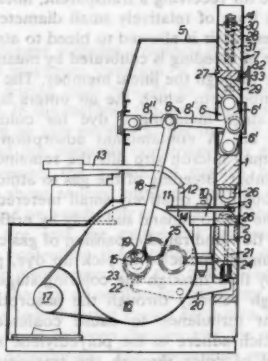


In a feeder die system, a gag system is provided which is adapted to simultaneously operate a plurality of actuators permitting reciptocating movement of feeder bar of a die. Provision is further made for utilizing the actuating force of the actuator cam for general die applications.

3,661,008
PRESSES

Barry Anthony Richardson, Coventry, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

Filed Mar. 17, 1970, Ser. No. 20,377
Int. Cl. B21j *9/18*
U.S. Cl. 72—451 **11 Claims**



A toggle press, in particular a coining press, in which a press slide is reciprocated towards and away from a thrust member by a first toggle linkage connected between the press slide and a stationary point and which is operated by a second toggle linkage connected between the first toggle linkage and a stationary point and which in turn is operated

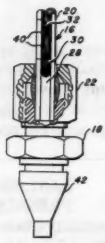
by a crank or eccentric driven at constant speed, the said two toggle linkages being of opposed angularity, and the length of the link of the said second toggle linkage which is connected to the said stationary point being shorter than the other link of the said second toggle linkage so that the press slide spends a greater part of its operating cycle near the top of its stroke removed from the thrust member than it does near the bottom of its stroke close to the thrust member. Additionally, the crank or eccentric deflects the second toggle linkage to one side of its center line for the major part of the operating cycle, and also deflects the second toggle linkage to a lesser extent to the other side of its center line during the remaining minor part of the operating cycle. Preferably, the lengths of the links of the second toggle linkage are substantially in the ratio 1:2 and the stroke of the press slide or ram is relatively short so that it remains close to the thrust member throughout its operations cycle.

3,661,009

GAS QUALITY INDICATOR AND METHOD FOR DETERMINING GAS QUALITY

Robert G. Leonard, Franklin, and Chester P. Surprise, Wauwatosa, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Apr. 2, 1970, Ser. No. 25,033
Int. Cl. G01n *21/06*
U.S. Cl. 73—23 **7 Claims**



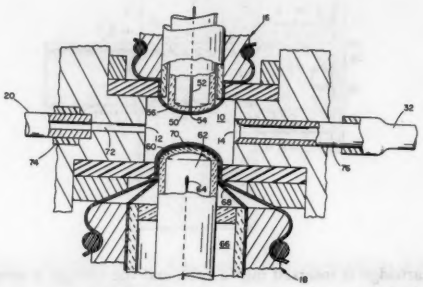
A compressed air line is provided with a coupling, including a shutoff valve for receiving a transparent, lineal, tubular member having a bore of relatively small diameter through which the compressed air is allowed to bleed to atmospheric pressure. The rate of bleeding is calibrated by means restricting the flow of air through the lineal member. The input end of the lineal member into which the air enters is provided with a coloring stage including a dye for coloring contaminates in the air. A contaminant adsorption stage of polyethylene of small micron size fills the remainder of the lineal tubular member. Bleeding of the gas to atmosphere at high velocity through the relatively small metered input to the tube causes the gas to expand suddenly by orifice action. The high velocity flow and rapid expansion of gas causes any vaporized contaminant particles to pick up dye, preferably bright red, as they flow through the coloring stage. The gas then flows at high velocity through the adsorption stage, creating sufficient turbulence to cause coalescence into colored drops which adhere to the polyethylene showing a progressive travel of color through the transparent lineal member with minimal loss of compressed gas in accordance with the amount of contaminant in the air. The rate of such color travel is calibrated and a scale along the length of the lineal member provides an output reading of the contamination in parts per billion sensitivity which may be read either directly in inches or in ounces of contamination per 100,000 cubic feet of air volume, depending on the scale used.

3,661,010

FLUID SAMPLE ANALYZING APPARATUS

Robert T. Neuwelt, Arlington, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Apr. 7, 1970, Ser. No. 27,193
Int. Cl. G01n *7/10*
U.S. Cl. 73—61 R **5 Claims**



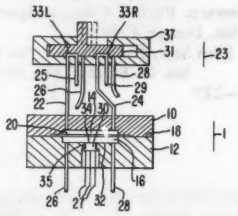
In a method of analyzing a fluid sample employing an electrochemical sensor that has a selectively permeable membrane disposed in the sample chamber, sample fluid to be analyzed is introduced into the sample chamber at a first flow rate, and flow of the sample fluid across the membrane in the sample chamber is continued at a reduced rate for a length of time greater than that required to fill the sample chamber at the first flow rate.

3,661,011

HIGH-SPEED MICROVOLUME MEMBRANE OSMOMETRY

Karl-Dieter S. Myrenne, Sunnyvale, Calif., assignor to Melabs, Inc.

Filed Mar. 2, 1970, Ser. No. 15,779
Int. Cl. G01n *13/04*
U.S. Cl. 73—64.3 **11 Claims**

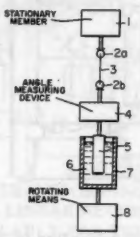


A membrane osmometer is disclosed comprising a semipermeable membrane having first and second opposing surfaces. Means are provided for receiving and confining a solvent in fluid communication with the first membrane surface. Means also are provided for receiving and confining a solution in fluid communication with the second membrane surface. The osmometer further includes a fluid supply inlet conduit, an outlet conduit, and a distributing valve having at least two positions whereby fluid communication may be established between the conduits and the solvent receiving and confining means with the valve in a first position and between the conduits and the solution receiving and confining means with the valve in the second position. A semiconductor pressure transducer is also provided having a pressure-sensitive surface element in pressure communication with the contents of one of the receiving and confining means.

3,661,012
APPARATUS FOR MEASURING TORSIONAL RIGIDITY OF FILAMENTOUS MATERIAL

Chikayasu Yamazaki, Kyoto-shi; Minoru Okabayashi, and Koichiro Ando, both of Otsu-shi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 9, 1969, Ser. No. 840,147
Claims priority, application Japan, Jan. 16, 1969, 44/3002
Int. Cl. G01n 3/22
U.S. Cl. 73—99 9 Claims

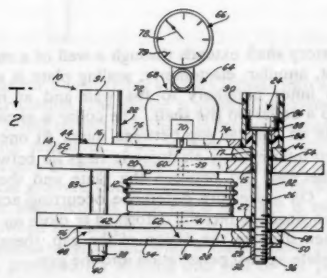


An apparatus for measuring the torsional rigidity of a fibrous material utilizes a rotating viscous liquid of known viscosity to impart a torque to the fibrous material. The fibrous material is clamped at its upper and lower ends by clamping devices and the lower clamping device is connected to a cylindrical mass which is floated in a viscous liquid of known viscosity contained within an outer container. The outer container is rotationally driven to impart a circular motion to the viscous liquid which accordingly applies a torque to the cylindrical mass. The torque applied to the cylindrical mass effects turning of the fibrous material and the extent of turning is measured to obtain an output proportional to the torsional rigidity of the fibrous material.

3,661,013
SEMICONDUCTOR ASSEMBLY

Lance C. Wilcox, Wilton, Conn., assignor to Electric Regulator Corporation, Norwalk, Conn.

Filed Dec. 23, 1969, Ser. No. 887,542
Int. Cl. G01l 1/04
U.S. Cl. 73—141 A 7 Claims

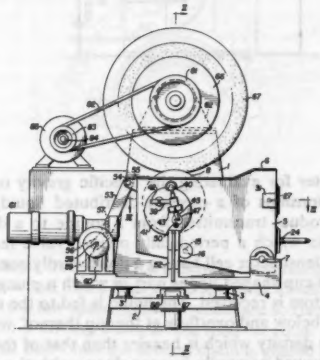


A semiconductor assembly comprises a semiconductor component, a body operatively connected to the semiconductor component, a force generating means operatively connected to the body and effective to force the body and the semiconductor into engagement, and means operatively connected to the force generating means and effective to vary its position. The variation in the position of the force generating means causes a variation in the engaging force between the body and the semiconductor component in the assembly. A force measuring means is operatively connected to the assembly and provides an indication of the exact force applied between components. The force measuring means is operatively connected to the force generating means, the latter being an elongated resilient member having raised end sections and a lowered central section in engagement with the body. The force measuring means is operatively connected to the raised end sections at one part and to the lowered central section at another part. The relative movement of these parts due to the change in position of the raised end sections is effective to provide a force indication on a readout gauge or the like. The change in position of the end sections is controlled by bolts which pass through the end sections and the body and are operatively connected to the semiconductor component. An insulating guide tube encloses each bolt and an insulating member partially supports each bolt head. The insulating members are effective to withstand the pressures generated by the adjustment of the bolts as well as electrically insulate the bolt heads.

3,661,014
METHOD AND APPARATUS FOR DETERMINING IRREGULARITIES IN THE BEHAVIOR OF TIRES ROTATING UNDER LOAD

Valerio Ciampolini, Milan, Italy, assignor to Industrie Pirelli S.p.A.

Filed Apr. 15, 1970, Ser. No. 28,625
Claims priority, application Italy, Apr. 23, 1969, 15.901 A/69
Int. Cl. G01m 17/02
U.S. Cl. 73—146 24 Claims



The disclosure includes a method and apparatus for determining the maximum variation of the rolling radius and the slip angle during each turn of an automotive tire rotating under load. In the method, the tire under test and a rigid surface having an axis parallel to the tire axis are brought into contact and are mutually compressed by application of an elastic pressure, the cylindrical surface being capable of oscillating about at least one axis lying in its median plane and disposed perpendicular to the axis of the cylindrical surface; the tire and the cylindrical surface are oppositely rotated by controlling the rotation of one or the other; and the angular displacements of the axis of the cylindrical surface about the axis of oscillation, which are caused by variations of the lateral thrust during each turn of the tire in the zone of contact between the tire and the adjacent surface, are then determined. The apparatus comprises a rigid cylinder rotatable about an associated shaft and capable of oscillating about an axle lying in its median plane and disposed perpendicular to the shaft. Such apparatus also includes an element adapted to produce elastic compression between the tire and cylinder and means for determining the angular displacements of the axis of the shaft about the axis of oscillation, which displacements are caused by variations

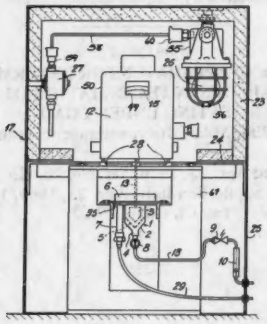
of the lateral thrust which occurs during each turn of the tire in the region of contact between the cylinder and tire as they are oppositely rotated.

3,661,015

DENSIMETER FOR PIPELINE-TRANSPORTED LIQUIDS

Guy Paul, Saint-Maur, Val de Marne, France, assignor to Societe des Transports Petroliers par Pipe-Line (Societe Anonyme), Paris, France

Filed Dec. 9, 1969, Ser. No. 883,459
Claims priority, application France, Dec. 11, 1968, 177619
Int. Cl. G01n *9/10*
U.S. Cl. 73—437 **8 Claims**



A densimeter for evaluating the specific gravity or mass-volume relationships of a pipeline-distributed liquid, e.g. a petroleum product transmitted from a source to a distribution center, in which a periodically opened valve feeds the liquid into a densimeter cell having a downwardly converging bottom and a cup-shaped upper part in which a plunger with a tapered bottom is received. The liquid is fed to the measuring cell from below and overflow at the top thereof, while the plunger has a density which is heavier than that of the liquid and thus is buoyed upwardly in accordance with the relative specific gravity of the liquid. The plunger is connected to a sensitive balance contained within a thermostatically controlled and mechanically insulated housing to produce an output representing the specific gravity of the liquid and to transmit this output to a digital readout indicating the specific gravity of the liquid and triggering automatic or manual response to facilitate distribution of the particular petroleum product traversing the pipeline.

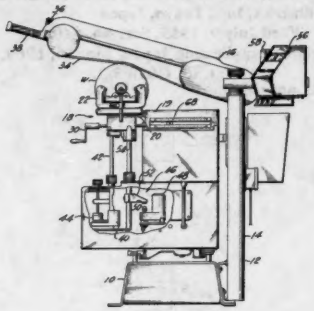
3,661,016

DIRECT READOUT BALANCING METHOD AND APPARATUS

David S. Dopp, Elk Grove, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed July 6, 1970, Ser. No. 52,528
Int. Cl. G01m *1/22*
U.S. Cl. 73—462 **13 Claims**

A balancing method and apparatus by which a direct readout of the amount of unbalance is provided in order than an operator can determine from a meter reading how much weight to add to an unbalanced body and where to position it. Apparatus for weighing the rotatable workpiece is included as an integral part of the unbalance detecting mechanism with means for attenuating the readout meter signal in accordance with the body weight so that the meter will give an accurate indication of the amount of unbalance in weight times rotational radius units when the body is



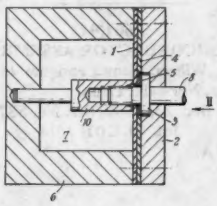
rotated at a predetermined proportion of the resonant speed of the system.

3,661,017

SEALING DEVICES FOR SHAFTS

Karl-Wolfgang Hubschmann, Langenweid, Germany, assignor to Motoren-Werke Mannheim AG Vorm, Benz Abt, Stationarer Motorenbau, Mannheim, Germany

Filed Sept. 17, 1970, Ser. No. 73,042
Claims priority, application Germany, Sept. 17, 1970, P 19 46 965.9
Int. Cl. F16j *15/50*
U.S. Cl. 74—18.1 **5 Claims**



An oscillatory shaft extends through a wall of a stationary body. A flat, annular, elastomeric, sealing plate is sealingly fixed at its inner periphery to the wall and at its outer periphery to a collar on the shaft. The collar is encircled by the wall with an annular gap between them. At one face of the plate two intermediate elastomeric rings lie between the plate and the wall and between the plate and the collar, respectively. On a pressure difference occurring across the plate, the two rings are thereby deformed to close an annular space between them in the region of the gap, thereby supporting the plate against penetration into the gap.

3,661,018

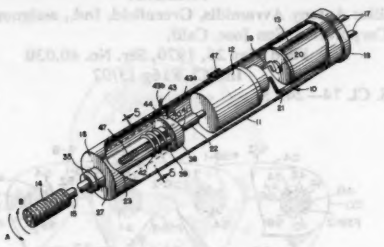
ELECTRIC BRUSHER

Richard K. Keefer, 3807 Beach Street, Rockford, Ill., and James L. Samorian, 2024 Fulton Street, Rockford, Ill.

Filed June 5, 1970, Ser. No. 43,769
Int. Cl. A46b *13/02*; F16h *23/00*
U.S. Cl. 74—22 R **5 Claims**

An electric brusher includes an action which both rotates and reciprocates to provide good brushing action. The brush is secured to a driven shaft which is slidably mounted with respect to a rotary drive shaft and which is operably con-

nected to the rotary drive shaft for rotation therewith. A cam wheel rotates with the drive shaft or the driven shaft and



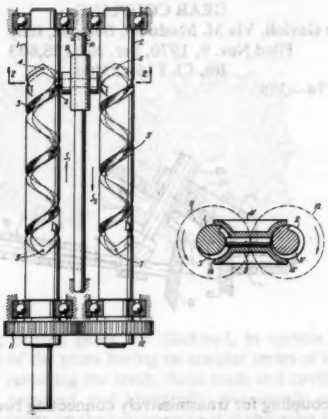
causes the driven shaft to reciprocate axially with respect to the drive shaft.

3,661,019

DEVICE FOR TRANSFORMING A ROTARY MOTION INTO A LINEAR REVERSING MOTION, PARTICULARLY FOR TEXTILE MACHINES

Josef Kacalek; Josef Bartos, and Miroslav Stransky, all of Usti Nad Orlici, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, Liberec, Czechoslovakia

Filed May 7, 1970, Ser. No. 35,316
Int. Cl. F16h *25/12*
U.S. Cl. 74—58 **4 Claims**



A device for transforming a rotary motion into a reciprocatory linear motion. The device is useful, for example, for use as a yarn laying traverse mechanism for textile machines such as winding machines. Two spaced parallel cylinders are driven, usually at constant speed. The cylinders are provided with helical grooves, corresponding elements of which are in transverse alignment. A yarn guide member is mounted for travel between and longitudinally of the cylinders. The yarn guide member is provided with a transversely slidable pin; means is provided for shifting one end of the pin into the helical groove in one of the cylinders at the end of a forward stroke of the guide member, and for shifting the other end of the pin into the helical groove in the other of the cylinders at the end of the reverse stroke of the guide member.

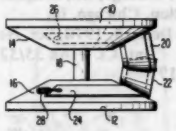
3,661,020

CIRCULAR ROLLER-BAND DEVICES

Preben W. Jensen, 21 Southside Avenue, Somerville, N.J., and Ole R. Jensen, 126 Nottingham Street, Montvale, N.J.

Filed June 30, 1970, Ser. No. 51,231
Int. Cl. F16h *15/16*
U.S. Cl. 74—192 **6 Claims**

The circular roller-band devices which substantially eliminate or minimize sliding friction are comprised of rotatable members arranged for movement along a circular path between two spaced walls. A flexible band is disposed about each pair of rollers in a substantially S-shaped configuration and the rollers are spaced apart a distance sufficient to



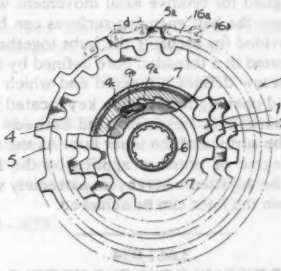
prevent the rollers from overriding each other. The flexible bands may be endless and disposed about two pairs of rollers or may have the opposite ends thereof secured to each wall respectively. The rollers are conical.

3,661,021

MULTIPLE FREE WHEEL FOR A BICYCLE

Masakazu Ohshita, c/o Shimano Industrial Co., Ltd. No. 77, 3-cho, Oimatsu-cho, Sakai City, Japan

Filed June 4, 1970, Ser. No. 43,389
Claims priority, application Japan, July 26, 1969, 44/71242
Int. Cl. F16h *11/04, 7/10*
U.S. Cl. 74—217 B **2 Claims**



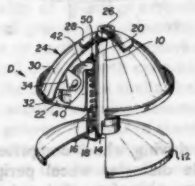
A multiple free wheel for a bicycle comprising a low speed sprocket wheel and a high speed sprocket wheel, wherein the dents of the low speed sprocket wheel are so formed as to engage with a driving chain at the interval equal to one pitch thereof so that when the driving chain is geared into the high speed sprocket wheel it is not disengaged from the low speed sprocket wheel however big the difference may be in dent number between the two sprocket wheels.

3,661,022

SHEAVE DRIVE

Zoel Bergeron, Valcourt; Quebec, and Leo Vadeboncoeur, St. Adolphe D'Howard, Quebec, both of Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada

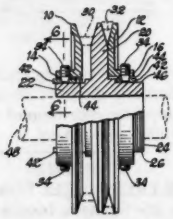
Filed June 26, 1970, Ser. No. 50,253
Claims priority, application Canada, June 23, 1970, 86,360
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **10 Claims**



A sheave drive which incorporates resilient shims in the radial slots of the sliding disc's hubs where the inner bell-crank arms of the governor are seated. An encircling band is

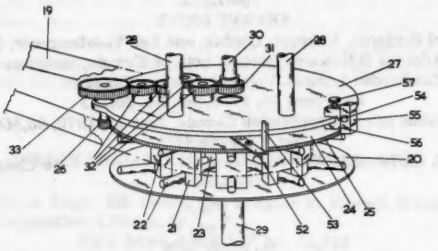
used to retain the shims in place and a shim assembly is taught wherein the shims are integral with the band.

3,661,023
ADJUSTABLE PULLEY CONSTRUCTION
Joseph E. Maurey, Chicago, Ill., assignor to Maurey Manufacturing Corporation, Chicago, Ill.
Filed Dec. 15, 1970, Ser. No. 98,276
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **8 Claims**



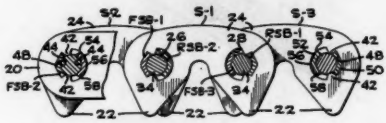
An adjustable pulley construction comprising a pair of discs each having a centrally located hub and defining opposed belt engaging surfaces. The hubs are threaded or otherwise designed for relative axial movement whereby the distance between the belt engaging surfaces can be adjusted. Means are provided for securing the hubs together including a set screw located in a threaded bore defined by the exterior hub. The set screw defines a tapered end which is received within a tapered opening formed in a key located in line with the threaded bore. This key is inserted between the end of the bore and the surface of the inner hub. As the set screw is rotated, the degree of pressure applied by the key on the inner hub can be adjusted whereby an extremely secure relationship between the hubs can be achieved.

3,661,024
ADJUSTABLE DRIVING WHEELS
Albert Edward Cooke, Leicester, England, assignor to Trip-Lite Limited, Leicester, England
Filed June 15, 1970, Ser. No. 46,340
Claims priority, application Great Britain, June 20, 1969, 31,213/69
Int. Cl. F16h *55/54*
U.S. Cl. 74—230.23 **7 Claims**



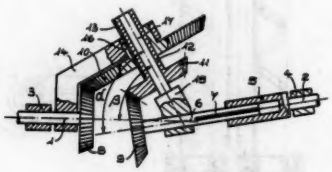
An adjustable driving wheel comprises a central holder having a variable diameter wheel periphery provided by blocks slidable on pairs of parallel rods radiating from the central Holder at uniformly spaced intervals around it, the blocks being movable simultaneously inwardly and outwardly by means of a rotary cam positioned at one side of the wheel.

3,661,025
SILENT CHAIN AND METHOD OF ASSEMBLY THEREOF
Stellios Antony Avramidis, Greenfield, Ind., assignor to FMC Corporation, San Jose, Calif.
Filed May 25, 1970, Ser. No. 40,030
Int. Cl. F16g *13/02*
U.S. Cl. 74—245 S **4 Claims**



A silent chain is disclosed in which sets of intermeshing links are connected together by means of pins received in front and rear openings in the links between two segmental bushings. Each segmental bushing is rigidly secured in the openings of one of the sets of links to form an inflexible link and bushing unit. Adjacent rigid link and bushing units pivot on each pin to provide flexibility of the chain without play or wear between the bushing segments and the links.

3,661,026
GEAR COUPLING
Gabriele Gavioli, Via M. Masia 30, Bologna, Italy
Filed Nov. 9, 1970, Ser. No. 128,603
Int. Cl. F16h *35/06*
U.S. Cl. 74—385 **6 Claims**

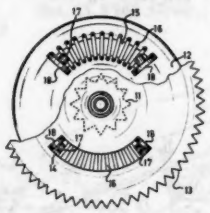


Gear coupling for transmissively connecting two supported shafts comprising a pair of main gears supported by said shafts, respectively, and engaging with a pair of secondary gears, respectively. The secondary gears are carried each by a supporting structure having at least one degree of freedom with respect to the shaft on which the structure is supported, thereby to allow said shafts to assume variable positions relative to one another.

3,661,027
DIAL-TYPE MEASURING INSTRUMENTS
Giovanni Gattesco, Crissier, Switzerland, assignor to Tesa S.A., Renens, Switzerland
Filed May 21, 1970, Ser. No. 39,328
Claims priority, application Switzerland, June 18, 1969, 9283/69
Int. Cl. F16h *57/10*
U.S. Cl. 74—411 **4 Claims**

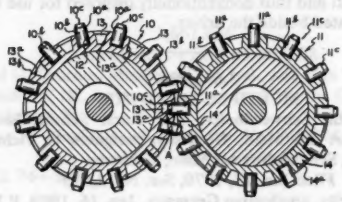
The present invention provides a dial-type measuring instrument comprising a geared multiplier mechanism intended to amplify the movements of a movable indicator member facing the dial, wherein the multiplier mechanism comprises a disk driven by the movable measuring member of the instrument and located opposite a toothed wheel which serves

to control the movements of the indicator member and is coaxial with the disk, said toothed wheel being connected to



the disk by means of at least two resilient constraining members.

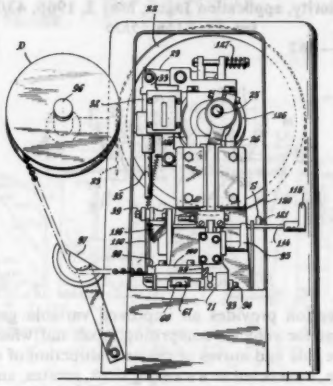
3,661,028
COACTING PIN-IN-HOLE GEARS
Gyula S. Fuchs, 1422 Grace Avenue, Cleveland, Ohio
Filed June 22, 1970, Ser. No. 48,022
Int. Cl. F16h *1/12, 1/06, 1/14*
U.S. Cl. 74—415 **1 Claim**



Coacting driving gears are disclosed, in certain embodiments each of the gears having an annular series of teeth and cavities for receiving the teeth, these teeth and cavities being alternately arranged and identically and evenly spaced in each of the series on the two gears so that the gears in driving relationship alternately have a tooth of a first of the gears entering into a cavity in the second of the gears, and immediately thereafter a tooth in the second gear enters into a cavity in the first gear. The axes of the two gears may be coplanar or with their axes arranged at 90° and with the axes of the coacting driving elements either arranged at ninety degrees to each other, or at a 45° arrangement. In certain embodiments where the axes of the gears are arranged at 90°, all of the teeth may be on one of the gears and all of the cavities may be on the other of the gears.

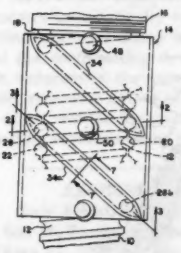
3,661,029
CRIMPING MACHINE
Ernest L. Cheh, Darien; Wade R. Bowden, Jr., Milford, and James D. Anderson, Norwalk, all of Conn., assignors to Burndy Corporation
Filed Nov. 4, 1968, Ser. No. 772,940
Int. Cl. B21d *43/00*
U.S. Cl. 72—419 **15 Claims**

A press has one or more dies and a work feed mechanism controlled by one die so that a change of dies adjusts the feed mechanism to the new dies and the work piece to be fed to the new dies. There is also a movable control to determine the point of contact of the feed mechanism and the work



pieces. The feed mechanism is readily releasable to permit removal of the work pieces at any time.

3,661,030
BALL SCREW AND NUT COMBINATION
Oscar J. Gagne, Grosse Pointe, Mich., assignor to Precise Services, Inc., Detroit, Mich.
Filed May 18, 1970, Ser. No. 38,454
Int. Cl. F16h *55/10*
U.S. Cl. 74—459 **5 Claims**



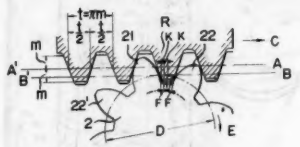
A ball screw and nut combination in which the nut is essentially cylindrical in configuration, is provided with internal threads and a plurality of openings extending generally tangentially into a thread groove and communicating with a helically formed groove or recess at the exterior in helical alignment with but spaced by a smooth cylindrical uninterrupted exterior surface of the nut from a similar helical groove communicating with a second opening communicating tangentially with a thread groove. A cover of sheet material such as metal or plastic is attached overlying the openings and helically extending grooves or channels, the cover having a helically extending groove communicating with said openings and recesses or channels and the smooth exterior surface of the nut to define an enclosed ball return passage interconnecting the openings.

3,661,031

VARIABLE GEAR RATIO STEERING GEARING

Yasumasa Mizukoshi, and Masato Yanagimoto, both of Fujisawa-shi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1969, Ser. No. 818,968
Claims priority, application Japan, May 2, 1968, 43/29117
Int. Cl. F16h *55/06*
U.S. Cl. 74—462 1 Claim



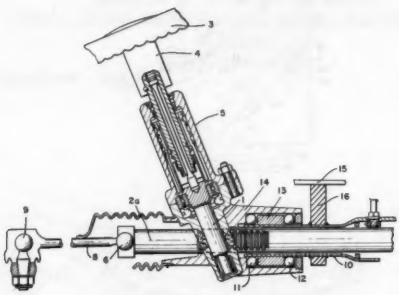
This invention provides an improved variable gear ratio steering gear for vehicles comprising a ball nut which has a rack on one side and moves in the axial direction of a worm, as the worm, connected to a steering shaft, rotates, and a sector gear meshed with said rack. According to this invention, the sector gear is formed by using a rack type gear cutter having blades symmetrically located at two places on the right and left sides of the center position of the sector gear when the vehicle is in its straight ahead position and provided with equal amount of lateral transposition, and the ball nut has the rack to be meshed with the sector gear having nearly the same tooth form as that of said rack type gear cutter.

3,661,032

STEERING ARRANGEMENTS FOR MOTOR VEHICLES

Leslie Richard Jenvey, Reading, England, assignor to Adwest Engineering Limited, Reading, England

Filed Nov. 10, 1969, Ser. No. 875,408
Int. Cl. B62d *3/12, 3/12*
U.S. Cl. 74—498 14 Claims



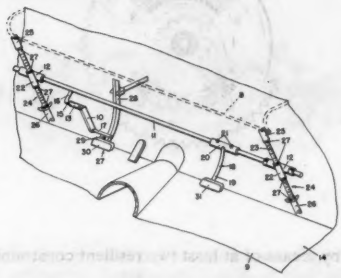
Rack-and-pinion steering mechanism for a motor vehicle, comprising a rack housing having a radial projection thereon, and resilient means arranged on opposite sides of the outward projection, the resilient means on each side of the outward projection being located between the outward projection and a part separate from the rack housing, the arrangement being such that when the pinion is rotated to move the rack the resilient means on one side of said outward projection will be compressed to provide, in effect, lost-motion between the pinion and the rack to a varying degree according to the amount of rotation of the pinion, so varying the steering ratio.

3,661,033

DUAL CONTROL DEVICE FOR AUTOMOBILES

John J. Stantus, North 5321 Lehman Road, Spokane, Wash.

Filed Dec. 11, 1969, Ser. No. 884,254
Int. Cl. G05g *1/16*
U.S. Cl. 74—562.5 2 Claims



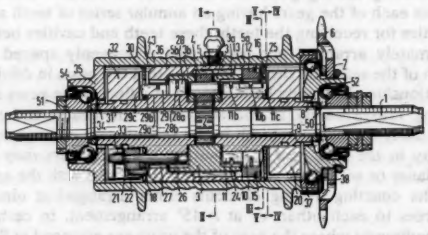
A selectively applicable dual control device for application to many automotive vehicles having a manually depressable foot pedal, comprising: a transverse rock shaft journaled in aligned journal bearings releasably fixed relative to the vehicle structure and having an articulate link pedal actuating means at one end and an arm having an auxiliary pedal, releasably attached for selective radial and axial positions to the rock shaft and thus conventionally disposed for use by an occupant seated beside the driver.

3,661,034

MULTIPLE-SPEED HUB

Hans Joachim Schwerdhofer, and Horst Schulz, both of Schweinfurt am Main, Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Jan. 13, 1970, Ser. No. 2,513
Claims priority, application Germany, Jan. 16, 1969, P 19 02 021.4
Int. Cl. F16h *5/46*
U.S. Cl. 74—752 E 21 Claims

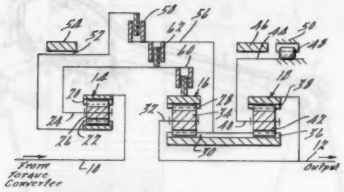


A three-speed bicycle hub has planetary gearing axially centered on the hub shaft. A driving sleeve coupled to the driver and drive sprocket is arranged on the shaft on one side of the sun gear and a driven shaft coupled to the hub shell on the other side. The planet carrier projects axially in both directions beyond the planet gears and the sun gear, and the ring gear similarly projects beyond the planet carrier. A pair of overrunning clutches on each side of the sun gear connects the two sleeves to the ring gear and to the planet carrier. One clutch of each pair can be disengaged by a centrifugal governor whose flyweight is mounted on a respective sleeve in a hub cavity portion remote from the gearing.

3,661,035
FOUR-SPEED RATIO PLANETARY TRANSMISSION

Po-Lung Liang, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1970, Ser. No. 90,303
Int. Cl. F16h 57/10
U.S. Cl. 74—763 4 Claims

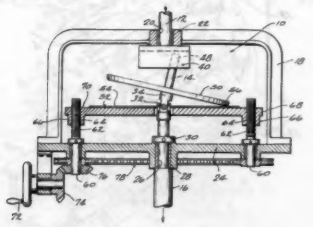


A power transmission mechanism for an automotive vehicle driveline having four forward driving speed ratios and a single reverse speed ratio comprising three simple planetary gear units and clutch and brake means for controlling the relative motion of the elements of the gear units, one gear unit acting as a torque multiplier for the other two gear units and a common reaction brake for the torque multiplier gear unit and the other two gear units during operation in each forward underdrive ratio as well as during reverse drive.

3,661,036
VARIABLE SPEED REDUCER

Ronald G. Quiram, Michigan City, Ind., and Don W. Eichner, Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 24, 1969, Ser. No. 869,024
Int. Cl. F16h 1/28
U.S. Cl. 74—800 1 Claim

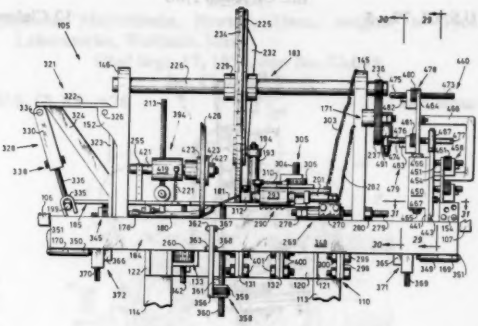


Disclosed herein is a speed reducer or variable speed drive which includes input, output, and intermediate shafts. One end of the intermediate shaft is connected to the output shaft by a universal joint. The other end of the intermediate shaft is received in a transverse slot at the end of the input shaft and is free to move outwardly in the slot from a position in axial alignment with the input shaft in response to centrifugal force upon rotation of the input shaft and thus cause the intermediate shaft to gyrate about the universal joint. The rate of rotation of the output shaft with respect to the input shaft is varied by selective axial movement of a disc which is engageable with a wobble plate secured to the intermediate shaft and which controls the displacement of the other end of the intermediate shaft.

3,661,037
SAW BLADES AND MACHINES FOR SERVICING THEM

Evangelos G. Athanasoulas, 20 Alexandrow Zarra Street, Arta, Greece

Filed Nov. 26, 1969, Ser. No. 880,343
Claims priority, application Greece, Nov. 28, 1968, 36114
Int. Cl. B23d 63/04
U.S. Cl. 76—58 24 Claims

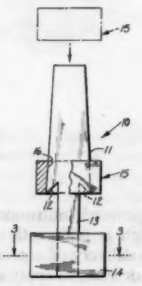


The teeth of a saw blade and particularly of a band saw blade are transversely set so that, for each such set tooth a portion of the tooth bounded by its leading edge and by an outwardly extending line of set is disposed transversely to the remainder of the tooth. The line of set extends edgewise outwardly from the leading edge of the tooth along a line generally parallel to the leading edge. A machine for performing a servicing operation such as tooth-sharpening and/or tooth-setting comprises a clamping device for periodically clamping and releasing the saw blade and a sharpening and/or tooth-setting device for operating on the teeth of the blade while it is clamped. A blade advance mechanism includes a toothed plate which engages several teeth of the blade and reciprocates longitudinally to advance the blade through the machine when the clamp is released. The sharpening wheel and the tooth-setting device are usefully adjustable to permit variation of the sharpening angle, of the depth of set, of the transverse extent of setting, of the angle between the line of set and the longitudinal direction of the blade and of the setting sequence along the blade.

3,661,038
SAW SWAGE TOOL

Lexie L. Steward, Box 20, Randolph, Miss.

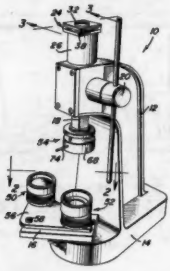
Filed June 17, 1970, Ser. No. 46,965
Int. Cl. B23d 63/04
U.S. Cl. 76—72 1 Claim



A device of improved structure for the perfection of saw teeth. The device includes a body member which receives a

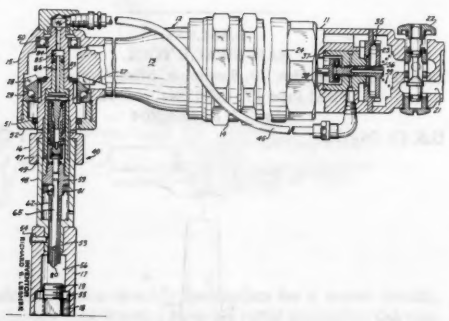
non-expansive band, the structure being used on inserted saw teeth as used by saw mills.

3,661,039
CUTTING AND ASSEMBLING APPARATUS FOR MAKING BUTTONS
Richard L. Lewis, Promoco Enterprises Limited Route 29, Pekin, Ill.
Filed Apr. 20, 1970, Ser. No. 30,094
Int. Cl. A44b *1/06*
U.S. Cl. 79—5 12 Claims



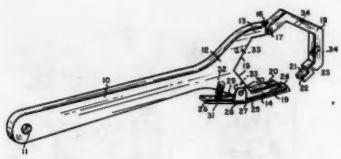
Portions of a pin-on button are cut and assembled as a result of a plurality of operations in a machine having a vertical press. Cutter and work deforming tools are displaced by a single press ram to cut blanks and deform the blanks onto a button top placed in one of two die assemblies positioned in alignment below the work deforming tool on the lower end of the ram.

3,661,040
PNEUMATIC NUTRUNNER WITH WORK MARKING MECHANISM
Richard S. Lesner, Pontiac, Mich., assignor to Chicago Pneumatic Tool Company, New York, N.Y.
Filed June 8, 1970, Ser. No. 44,417
Int. Cl. B25b
U.S. Cl. 81—52.5 10 Claims



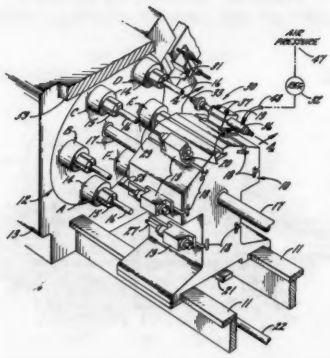
A pneumatically powered nutrunner provided with marking mechanism which is pneumatically operable automatically in response to delivery of a preset torque to the work, such as a bolt head or stud, to apply a series of visible marks to the work. The marks serve to indicate that the required torque has been delivered. In one embodiment, the marking mechanism is combined with a nutrunner; and in another embodiment, it is a separate unit.

3,661,041
SOCKET WRENCHES
Rudolf Welz, 122 Ethelbert Street, Winnipeg 10, Manitoba, Canada
Filed Aug. 26, 1970, Ser. No. 67,158
Int. Cl. B25b *13/28*
U.S. Cl. 81—98 3 Claims



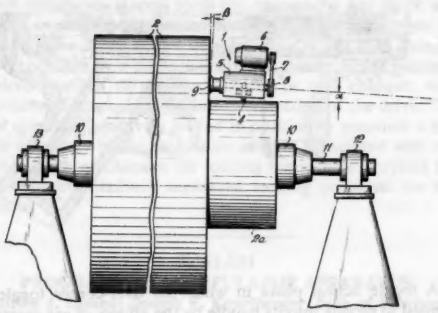
A socket wrench wherein one-half of the socket casing is hinged to swing on and clear of the other half thereof, for spanned reception of a nut therein; said casing having a spring catch on the side remote from the hinge for releasable closure of the socket casing around the nut; and means for receiving a split reducer within the socket casing to operate said wrench on a smaller nut, and such that said casing and reducer will swing open and shut together.

3,661,042
CENTERING MECHANISM FOR MACHINE TOOLS
Chester A. Lender, Rockford, Ill., assignor to Slick Electro Inc., Rockford, Ill.
Filed July 2, 1970, Ser. No. 51,853
Int. Cl. B23b *9/04*
U.S. Cl. 82—3 5 Claims



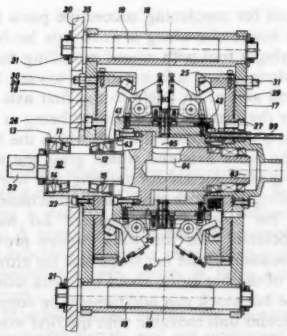
A machine tool, such as an automatic screw machine, having a centering device which is mounted on a tool head and engages the end of a workpiece held by a rotating spindle on a work head as the tool head moves toward the work head. After engagement, the movement of the tool head continues and the centering device slides back relative to the tool head. Pressure fluid under the control of a pressure regulator acts on a piston which holds the centering device against the workpiece. The regulator maintains a constant pressure so that the force with which the centering device engages the workpiece also remains constant.

3,661,043
APPARATUS FOR SLITTING ROLLED WEBS
Heinz Voigt, Bielefeld, Germany, assignor to Feldmuhle Aktiengesellschaft, Duesseldorf, Germany
Filed Apr. 1, 1970, Ser. No. 24,790
Int. Cl. B23b 3/04
U.S. Cl. 82—101 10 Claims



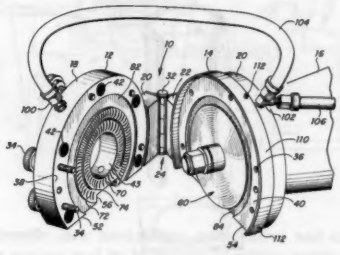
Rolled webs of papers and the like are slit by means of a conical rotary cutter riding the rotating roll, and the severed web portion is unwound. The cutter is mounted on a carrier arm by means of a pivot located close to a vertical plane through the roll axis, and the orthogonal projection of the axis of rotation of the cutter in that plane is inclined relative to the roll axis at an angle of 1.5°–8° to minimize friction between the cutter blade and the radial slit face of the remainder of the roll.

3,661,044
ROTARY PERFORATING APPARATUS
Emanuel Hubert Duden, Mortsel, and Joseph Marie Cappuyns, Berchem, both of Belgium, assignors to Gevaert AGFA N.V., Morstel, Belgium
Filed May 8, 1970, Ser. No. 35,710
Claims priority, application Great Britain, May 9, 1969, 23,828/69
Int. Cl. B26f 1/08
U.S. Cl. 83—100 15 Claims



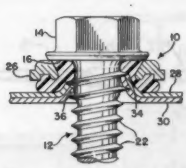
A rotary film perforating apparatus for making the edge perforations in photographic film comprising a rotary wheel carrying on its periphery closely spaced individual perforator assemblies. Each perforator assembly comprises a base fitted with a die element and a pivotable perforator arm carrying a punch element and both elements may be readily removed from the assembly. The arm frictionally engages wall portions of the die element to thereby receive exact guidance with respect to the die. The material hardness of the arm is greater than that of the die so that the arm does not wear out and the replacement of a used die element by a new one entails automatically a renewal of the guidance of the perforator arm.

3,661,045
APPARATUS FOR STABILIZING A ROTARY SAW BLADE
Seymour Mermelstein, Newton, Mass., assignor to Tyco Laboratories, Waltham, Mass.
Filed Sept. 17, 1970, Ser. No. 73,009
Int. Cl. B26d 1/12
U.S. Cl. 83—676 18 Claims



A guide for a rotary saw blade comprising a housing having two inner opposed guide surfaces that define a space for receiving a saw blade mounted on a rotatable arbor and including means for directing a liquid under pressure against the opposite faces of the blade during rotation thereof so as to hydrodynamically stabilize the blade.

3,661,046
COMBINATION SCREW
Cornelius Byron Waud, Lake Forest, and Ned J. Gruca, Dundee, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Nov. 9, 1970, Ser. No. 87,763
Int. Cl. F16b 25/00, 35/00
U.S. Cl. 85—46 11 Claims



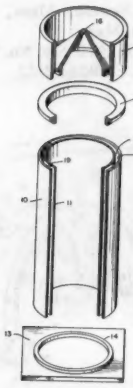
A fastener unit for use in metal building construction in which a compressible sealing washer is used in combination with a threaded shank including a threaded portion of limited axial extent having a crest diameter substantially greater than the crest diameter of the remaining threads on the shank. The fastener unit is capable of being utilized to attach two relatively thin sheets of material while at the same time is configured in such a manner to be able to fasten a thin sheet of material to a structural member. The larger diameter threaded section pulls at least one sheet of material up towards the head of the fastener as the fastener is tightened and the sealing washer is compressed.

3,661,047

APPARATUS FOR CASTING THIN WALLED HOLLOW CYLINDRICAL INSERTS

Wallace E. Silver, Ridgecrest, and Jack Sherman, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 18, 1968, Ser. No. 777,211
Int. Cl. C06b *21/02*; F41b *1/00*
U.S. Cl. 86—1 R 1 Claim



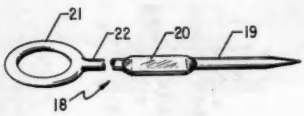
A mold for casting thin-walled hollow cylindrical inserts from hazardous materials for use in warheads, rocket motors and pyrotechnic flares. The apparatus comprises a plurality of disposable presized tubes fitted within each other, and spaced apart so as to form mold spaces or chambers which are filled with a hazardous material, such as explosive. Upon curing the tubes are peeled off leaving thin-walled tubular inserts.

3,661,048

FASTENING MEANS FOR STRUCTURAL MEMBERS

Watson M. Judd, Eastlake, Ohio, assignor to Town Line Erection Company, Incorporated, Mentor, Ohio

Filed June 16, 1969, Ser. No. 833,639
Int. Cl. F16b *21/14*
U.S. Cl. 85—7 12 Claims



A fastening means for securing structural members including structural beams has an unthreaded bolt having a partially tapered shank, a noncircular head and at least one hole through the shank and a generally rod-shaped locking pin one end of which is capable of fitting in the hole in the shank of the bolt, the locking pin having an eye portion at the other end adapted to receive a tool therethrough to facilitate removal of the locking pin from the bolt and an expanded portion in the locking pin limiting the portion of the locking pin passing through the hole in the bolt.

ERRATUM

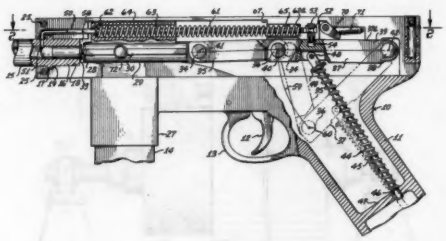
For Class 86—1 see:
Patent No. 3,661,047

3,661,049

GAS OPERATED TOGGLE ACTION WEAPON

Walter E. Perrine, 511 N. 52nd Street, Phoenix, Ariz.

Filed Mar. 18, 1970, Ser. No. 20,578
Int. Cl. F41d *5/04*
U.S. Cl. 89—189 2 Claims



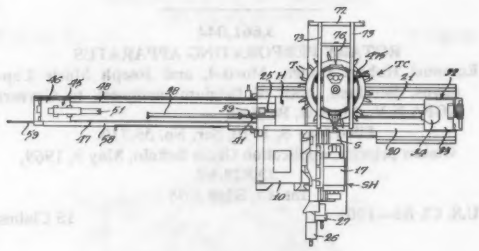
A toggle action pistol in which an over-center toggle is tripped to recede into its handle by the effects of gas pressure generated at the time of firing.

3,661,050

MACHINE TOOL HAVING WORK FEED MEANS

Carl F. Erikson, Belvidere, Ill., assignor to Sundstrand Corporation

Filed July 15, 1969, Ser. No. 841,772
Int. Cl. B23c *9/00*; B23q *41/00*
U.S. Cl. 90—21 B 16 Claims



A machine tool for machining successive parts from bar stock extending lengthwise along a work axis having a tool spindle for carrying a tool with means mounting the spindle for movement along a first axis extending toward the work axis and a second axis at an angle to the first axis with the plane defined by the first and second axes being at an angle to the work axis, a work holder through which the bar stock extends along the work axis and which grips the bar stock during machining with means for moving the work holder and bar stock along the work axis during machining with a portion of the bar stock length exposed for machining. Mechanism associated with the work holder provides for regripping and location of the bar stock and for either indexable positioning of the bar stock about the work axis or rotation thereof. The bar stock can additionally be supported by a second work holder unit movable with the first work holder and movable relative thereto for varying the distance therebetween or, alternatively, by a steady rest unit which can grip the bar stock at either side of a machining location and provide support for the part of the bar stock at the side of the tool remote from the work holder by connection to the length of bar stock adjacent the work holder. Additionally, a third work holder can be used for additional support and positioning movement of the bar stock relative to the other two work holders. A variety of tools can be used in machin-

ing, as provided by a multispindle head or by a single spindle head in association with a tool changer. The tool changer holds a series of tools with their axes disposed radially of the axis of rotation of the tool changer and with insertion and withdrawal of a tool from the magazine being accomplished by movement of the magazine tool gripper in a direction transverse to the length of the tool.

Each of the work holders has gripping jaws for the bar stock which are shaped to firmly engage the bar stock and hold it in position relative to the work holder. The drives for indexing the work holder and indexing of the tool changer are controlled by a numerical control system which selects a desired position of the work holder or tool changer, with provisions for acceleration and deceleration of the drive. The tool spindle is positively locked in position to associate a key with a keyway in the tool or an adapter associated with the tool and the mechanism for locking the spindle provides for two distinct rotatively separated locking positions for the spindle.

3,661,051

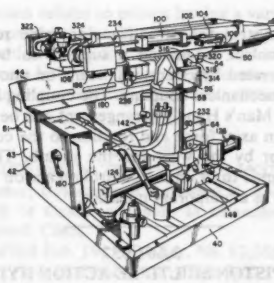
PROGRAMMED MANIPULATOR APPARATUS

Maurice J. Dunne; Joseph F. Engelberger, both of Newtown; Horace L. Gardner, Ridgefield, and Torsten H. Lindbom, Newtown, all of Conn., assignors to Unimation, Inc., Bethel, Conn.

Continuation of application Ser. No. 808,152, Mar. 18, 1969, now abandoned. This application Aug. 18, 1970, Ser. No. 64,802

Int. Cl. F15b *21/02*

U.S. Cl. 91—35 **29 Claims**



A programmed manipulator apparatus employs a contunuously rotating memory drum in which may be stored signals representing a number of steps in a desired sequence of operations. A portable teach control assembly is employed during the teaching operation to establish a desired position of the manipulator arm which is then recorded on the memory drum.

During repetitive work cycles, the recorded signals are used as command signals and are compared with encoder signals representing absolute position to move the manipulator arm to each set of positions in sequence. The manipulator arm may be moved over curved paths by employing artificial coincidence signals which are developed while large error signals still exist in the controlled axes. A common comparator and digital-to-analog converter is employed for all of the controlled axes which provides coincidence signals representing different magnitudes of error.

3,661,052

HYDRAULIC JACK

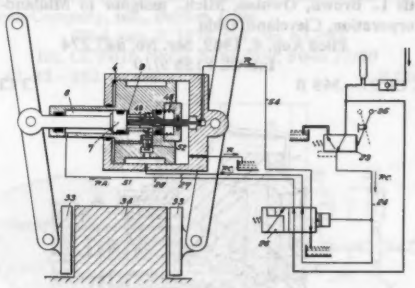
Rene Lucien, Neuilly-sur-Seine; Yves A. Pascal, Montrouge, and Pierre M. Ghobert, Paris, all of France, assignors to Societe Messier and Societe De L'Aerotrain, Paris, France, part interest to each

Filed Jan. 9, 1970, Ser. No. 1,789

Claims priority, application France, Jan. 10, 1969, 6900313

Int. Cl. F01b *7/20*; F15b *15/26*

U.S. Cl. 91—173 **9 Claims**



A hydraulic jack having two consecutive and completely different actions and its hydraulic operating means, the jack responding to the control order given by the operating means in the form of the supply pressure on a first input of the jack and the control pressure on a second input of the jack, while automatically effecting two consecutive actions in the same direction, the first action being a travel of large amplitude (naturally with a low force), while the second action develops a large force proportional to the control pressure (with a zero or very small travel), the disappearance of the control order resulting, by the operating means which apply the supply pressure to a third input of the jack, in the return movement of the travel of large amplitude only.

3,661,053

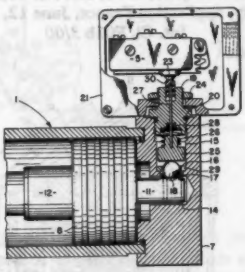
REVERSING SWITCH ACTUATOR FOR FLUID MOTOR

Beldon L. Rich, Buffalo Grove, Ill., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 4, 1970, Ser. No. 95,311

Int. Cl. F01l *25/08*; F15b *15/22*

U.S. Cl. 91—275 **12 Claims**



A fluid motor having piston actuated switches on the cylinder heads thereof which control operation of a solenoid reversing valve to achieve automatic reciprocation of the piston. Each switch actuator comprises a radially positioned assembly which includes a relatively large diameter ball which is engaged by the piston as it approaches the end of its stroke, a large diameter spring follower which is spring biased against the ball, and a small diameter actuator rod

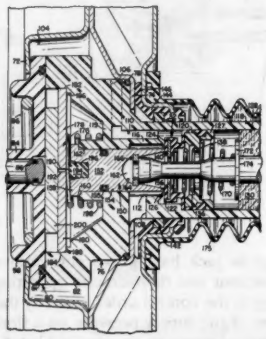
which has sliding sealed engagement with a switch retainer in the cylinder head, the radially inner end portion of the rod being engaged with the spring follower and the radially outer end portion of the rod being engageable with the switch plunger to close the switch contacts to reverse the piston when the ball, follower, and rod have been moved radially outwardly by the engagement of the piston with the ball.

3,661,054

POWER BRAKE MECHANISM

Curtis L. Brown, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Aug. 4, 1969, Ser. No. 847,274
Int. Cl. F15b *9/10*
U.S. Cl. 91—369 B **3 Claims**



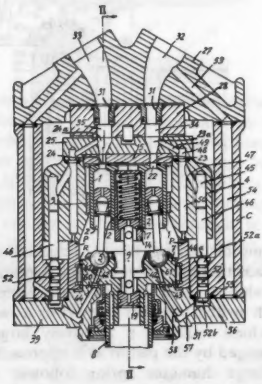
A two-stage power brake mechanism including a pressure-responsive movable wall, encapsulated valve means controlling the pressure differential on opposite sides of the wall, actuating means operable in a first stage to effect movement of the valve means in response to manual effort, reaction means operable in a second stage to resist movement of the actuating means in a substantially direct and uniform ratio to the force developed by the wall.

3,661,055

MULTI-CYLINDER BARREL HYDRAULIC PUMPS OR MOTORS

Francois C. Pruvot, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed May 26, 1970, Ser. No. 40,541
Claims priority, application France, June 12, 1969, 6919519
Int. Cl. F01b *3/00*
U.S. Cl. 91—486 **5 Claims**



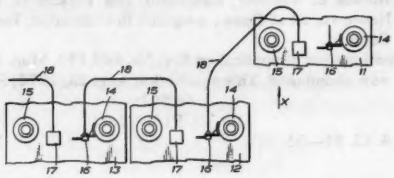
Multi-cylinder barrel pump or motor of which the capacity is variable by controlling the displacement of the barrel in a support adapted to be inclined more or less in the pump casing about a pivot axis perpendicular to the axis of rotation of said barrel, the piston of the pump cylinders being provided with ball-shaped ends for connecting same to an impeller plate rotatably solid, together with said barrel, with the pump driving shaft, wherein said impeller plate is balanced in the axial direction by a hydrostatic bearing in alignment with the bearing slide face of said plate in the pump casing, and having a port corresponding to the delivery port of said distributor slide face and adapted to be connected to the delivery side of the pump through the medium of a check and balancing valve.

3,661,056

CONTROL SYSTEMS FOR SELF-ADVANCING MINE ROOF SUPPORTS

John Cooke, Bolton, England, assignor to Gullick Dobson Limited, Wigan, Lancashire, England

Filed May 22, 1970, Ser. No. 39,766
Claims priority, application Great Britain, May 28, 1969, 26,872/69
Int. Cl. F15b *11/07*
U.S. Cl. 91—413 **6 Claims**



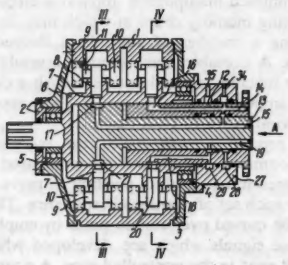
A control system for self-advancing mine roof supports comprising control means on a support to be controlled thereby is operated by operating means on another support by a flexible mechanical coupling. The coupling is a sheathed wire. A Dead Man's Handle arrangement can be provided by transmitting an axial force and rotation to the control means by the wire or by the wire and the sheath. The operating means is designed to fit on the control means on removal of a damaged wire as a temporary measure.

3,661,057

RADIAL-PISTON MULTIPLE-ACTION HYDRAULIC MOTOR

Anatoly Yakovlevich Rogov, Moskovskoi obl., pos. VUGI, 24, kv. 26, Ljubertsy, U.S.S.R.

Continuation of application Ser. No. 738,357, June 19, 1968, now abandoned. This application May 11, 1970, Ser. No. 37,394
Int. Cl. F01b *1/06, 13/06*
U.S. Cl. 91—482 **3 Claims**



A radial-piston, multiple-action hydraulic motor comprises a casing in which a rotor with an even number of rows of radially arranged pistons is rotatable, the casing having

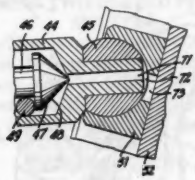
guides with profiles containing noncontrolled and controlled sections. The pistons of one half of the rows interact first with the noncontrolled sections then with the controlled sections and the pistons of the second half of the rows interact first with the controlled sections and then with the non-controlled sections of the profiles. A journal-type distributor is installed in the rotor and has at least two coaxial journals with channels for distributing working fluid and controlling the displacement volume of the hydraulic motor by turning synchronously in opposite directions relative to their axis, the distributing channels of each journal communicating hydraulically with one half of the rows of the pistons.

3,661,058

PUMP HAVING A VARYING OUTPUT

Robert J. GH. Peron, Sclaigneaux-Sclayn, Belgium, assignor to G. Dumont Et Freres Societe Anonyme, Sclaigneaux-Sclayn, Belgium

Filed Sept. 12, 1969, Ser. No. 857,379
Claims priority, application Belgium, Sept. 26, 1968, 721.410
Int. Cl. F01b *3/00*
U.S. Cl. 91—488 **2 Claims**



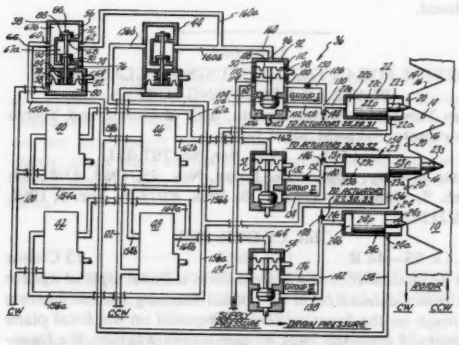
This invention relates to pumps having a varying output of the type comprising a plurality of parallel pistons housed in a common barrel, a means for rotating the said barrel about its axis and an angularly variable plate in relation with the said pistons for varying or adjusting their axial shifting.

3,661,059

FLUID OPERATED STEPPING MOTOR

John M. Hunter, Granby, and Raymond V. Thompson, Simsbury, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Feb. 19, 1970, Ser. No. 12,585
Int. Cl. F01l *15/00*; **F01b** *3/00*
U.S. Cl. 91—499 **11 Claims**



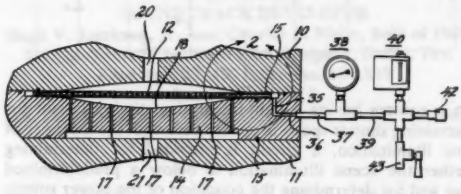
A fluid operated stepping motor has a rotor with a plurality of ramps. A plurality of pistons are positioned in the stator of the motor on opposite sides of the rotor in alignment with the rotor axis to rotate the rotor. A logic circuit is adapted to accept a digital signal to rotate the rotor a discrete amount in either a clockwise or counterclockwise direction. The logic circuit actuates only certain pistons which stroke to rotate the rotor. The position of the rotor determines which of the pistons will be stroked upon receipt of the next signal by the logic circuit.

3,661,060

DIAPHRAGMS FOR HIGH PRESSURE COMPRESSORS AND PUMPS

John C. Bowen, Huntingdon Valley, Pa., assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Aug. 5, 1970, Ser. No. 61,092
Int. Cl. F01b *19/00*; **F16j** *3/00*; **F04b** *21/00*
U.S. Cl. 92—102 **8 Claims**



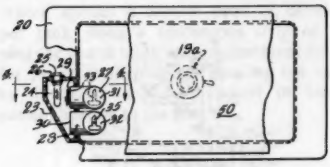
Diaphragms are provided for high pressure compressors and pumps, the diaphragms having heat insulation properties, extended life and apparatus capable of detecting diaphragm leaks associated therewith.

3,661,061

PICTURE POSITION FINDER

Richard D. Tokarz, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed May 5, 1969, Ser. No. 821,597
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 **2 Claims**



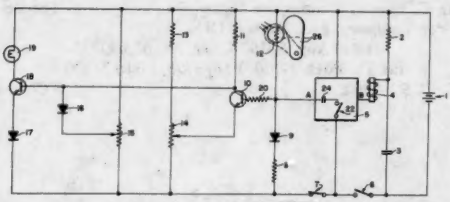
A device which shows the up-and-down orientation of a photograph regardless of the camera attitude at the time the picture was taken. A freely rotatable pointer in the camera body is gravity responsive and an image thereof is projected on the film. In another embodiment images are projected on the film of a pair of pointers mounted at right angles to each other to indicate the up-and-down orientation of the photograph whether the camera is rotated in a vertical plane parallel to the film or rotated in a vertical plane normal to the film; a fiber optics system provides means for transmitting images of the pointers to the film where the pointers are mounted exterior to the camera.

3,661,062

TEST CIRCUIT FOR PHOTOGRAPHIC CAMERAS

Otto Wisst, Waiblingen, Germany, assignor to Eastman Kodak Company

Filed Mar. 11, 1971, Ser. No. 123,278
Claims priority, application Germany, Mar. 20, 1970, P 20 13 432.1
Int. Cl. G03b 7/08; G01j 1/44
U.S. Cl. 95—10 CE 6 Claims



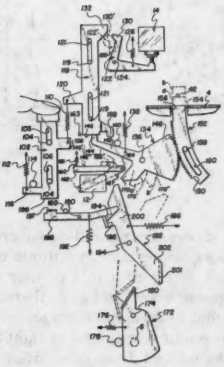
In a camera having a light-integrating, timing circuit for determining shutter speed in accordance with the intensity of scene illumination, a circuit is provided for determining whether the scene illumination is below a predetermined value and for determining the condition of the power source to be inserted in the timing circuit. The test circuit includes an indicating means such as a lamp, a first switch for energizing the lamp, an element whose impedance is dependent upon incident scene illumination, and a second switch which serves to turn "on" the first switch when scene illumination incident upon the element falls below a predetermined value. The test circuit further includes a circuit element (or combination of circuit elements) responsive to the potential of the energizing source, for preventing the second switch from turning "on" the first switch when the potential of the energizing source is below a predetermined value.

3.661,063

MECHANISM FOR SENSING THE CONDITION OF A PERCUSSIVE FLASH DEVICE AND FOR EFFECTING SYNCHRONOUS PERCUSSIVE FLASH EXPOSURES

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 27, 1970, Ser. No. 23,127
Int. Cl. G03b 9/70
U.S. Cl. 95—11.5 2 Claims



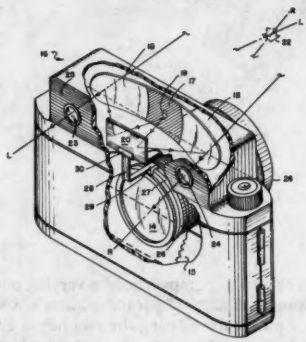
A mechanism for effecting synchronous flash exposures in a camera adapted to receive a percussive flash device of the type incorporating a pre-energized impacting member. According to several embodiments, a high energy lever is released from a set condition in response to the displacement of a release member, and operates to actuate the camera shutter and release the impacting member of the flash device, thereby effecting a synchronous flash exposure. The condition of the impacting member at the camera firing site is determined by a gear driven actuating probe, which additionally serves to fire the flash device. A visual signal indicates that the impacting member is not in the set condition. According to other embodiments, displacement of a release member by a prescribed amount in turn moves a latch which releases high energy levers for effecting synchronous flash exposures.

3,661,064

STEREO RANGEFINDER

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 15, 1970, Ser. No. 37,667
Int. Cl. G03b 3/00
U.S. Cl. 95—44 C 22 Claims



A photographic camera having a variable focus objective lens incorporates a binocular rangefinder of the "stereo" type including a reticle and lens means for projecting a virtual image of the reticle a predetermined distance into the viewed field. Left and right eye view windows are located to intercept different portions of common imaging wavefronts defining the virtual reticle image. The rangefinder is coupled to a focus adjustment mechanism for the camera such that the image distance of the projected reticle image and the focused distance of the camera objective lens are caused to vary in correspondence. A novel rangefinding method is also disclosed.

3,661,065

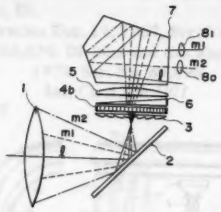
DEVICE FOR OPTICAL FOCUSING A GLASS FIBER PLATE AS A FOCUSING SCREEN

Yasuo Yamazaki; Mitsuo Furuta, both of Osaka, and Yoshio Kuramoto, Saka-shi, all of Japan

Filed Feb. 6, 1969, Ser. No. 797,021
Claims priority, application Japan, Nov. 25, 1968, 43/85603; Feb. 9, 1968, 43/8117; Feb. 8, 1968, 43/7829; Apr. 1, 1968, 43/21282
Int. Cl. G03b 3/00
U.S. Cl. 95—44 R 13 Claims

In an optical focusing system as in a finder optical system of a reflex camera or in an optical focusing system wherein an image on the focusing screen disposed on the focal plane is observed from the back of said screen whereby the focusing condition of the image forming optical system can be detected, the present invention relates to a device for optical focusing, utilizing a glass fiber focusing plate as a focusing screen, which is characterized in that said focusing screen is provided with an incident end face of an optical fiber plate composed of many optical fibers secured with one another in

a parallel array. In order to observe through the light ray passing through the circumferential portion of the lens of the image-forming optical system, which comes into said incident



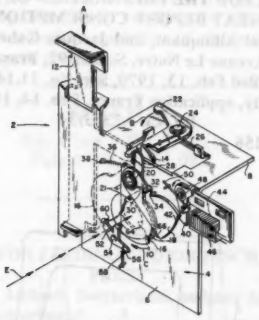
end face, it is possible to observe at a position away from the optical axis of said image-forming optical system, on the back of said optical fiber plate.

3,661,066

SELF-COCKING TWO BLADED PHOTOGRAPHIC SHUTTER

Helmut Ettischer, Ruit/Wurttemberg, and Ernst Lieser, Stuttgard-Vaihingen, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,202
Claims priority, application Germany, Apr. 5, 1969, P 19 17 507.6
Int. Cl. G03b *9/10*
U.S. Cl. 95—60 **10 Claims**



A self-cocking shutter including two blades, each of which is movable between first and second positions. The blades are positioned by springs which are arranged so that their forces do not act against each other. One spring moves a first shutter blade from its first to its second position and a second spring returns both of the shutter blades to their first positions.

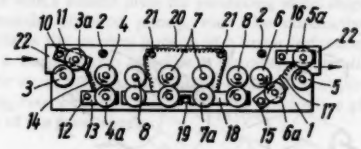
3,661,067

DEVICE FOR USE IN FILM DEVELOPMENT, FIXING, AND RINSING TROUGHS WITH PARALLEL DRIVE ROLLERS

Jaakko Aarnio, Ulappasaarentie 8 D 47, Helsinki 98, Finland

Filed Apr. 10, 1970, Ser. No. 27,204
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 A **2 Claims**

A device for use in film development, fixing, and rinsing troughs, to which are mounted and which include parallel driving rollers at intervals all located in the same plane. Counter rollers are located in contact with the driving rollers and a bevel tooth spindle wheel is connected to one end of



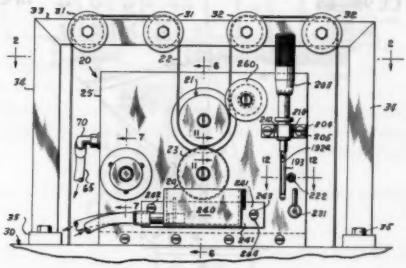
each driving roller and a spindle which is in contact with each spindle wheel is mounted on a common driven shaft.

3,661,068

SOUND TRACK DEVELOPER

Hugh V. Jamieson, Jr., and Charles F. Melze, both of Dallas, Tex., assignors to Jamieson Film Company, Dallas, Tex.

Filed Apr. 27, 1971, Ser. No. 137,829
Int. Cl. G03d *3/12*
U.S. Cl. 95—94 R **10 Claims**



A sound track developer for use in processing a black and white sound track on color film operated by a vacuum wheel driven by the film. The film is held in driving engagement with the wheel by a vacuum system which imposes a sufficient vacuum around a portion of the wheel periphery and the back face of the film for slip-free driving of the wheel by the film. The vacuum wheel drives a developer applicator wheel which applies a narrow bead of developer from a developer tank along a continuous strip of the film for developing the sound track only. Adjustment devices are provided for properly aligning and spacing the vacuum wheel and the developer applicator wheel to insure uniform developer application to the film.

3,661,069

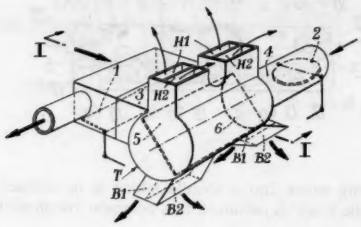
VENTILATION DEVICE FOR AUTOMOTIVE VEHICLES

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Feb. 18, 1970, Ser. No. 12,394
Claims priority, application France, Feb. 26, 1969, 6904943
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.05 **2 Claims**

A ventilation device notably for automotive vehicles, comprising a pair of shutters controlling the ingress and adjusting the input of each one of two streams, respectively of fresh air and warm air, which are directed into a distributor box having at least two outlet ducts leading to two different outlet louvres, characterized in that each one of said ducts is divided into two parallel adjacent channels, and that a switch-over member rotatably mounted in a cylindrical portion of said distributor box, is adapted to be set in any one of three

positions in which it is adapted to direct each stream either towards the two channels of one or the other outlet duct, or towards one of the two adjacent channels of each one of said ducts.



3,661,070

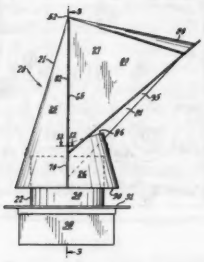
VENTILATOR HOOD ASSEMBLY

Lester L. Miller, 2226 Rogers Road, Jacksonville, Fla.

Filed June 24, 1970, Ser. No. 49,348

Int. Cl. F23l *17/02*

U.S. Cl. 98—68 **18 Claims**



A rotatable ventilator hood having a full conical half portion, a forward conical portion and a wing portion connected together by standing seams internally of the hood. The wing portion includes a pair of wing walls extending downwardly at their connections to and below the termination of the forward portion, and a top portion integral with the wing walls, the top portion being inclined downwardly and being rounded in a plane perpendicular to the inclination thereof. One of the wing walls is larger in surface area than the other wing wall. Lubrication means are mounted to a brace member of the hood through which a stationary shaft extends for lubricating same during rotation of the hood thereon.

3,661,071

APPARATUS FOR PRODUCING EXPANDED FOOD STUFFS BY GASEOUS CONVEYING HEATING

Ryozo Toei, Kyoto; Tatsuo Aonuma, Kashiwa-shi; Hiroharu Watanabe, and Toshizumi Yuasa, both of Noda-shi, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed June 13, 1969, Ser. No. 833,043

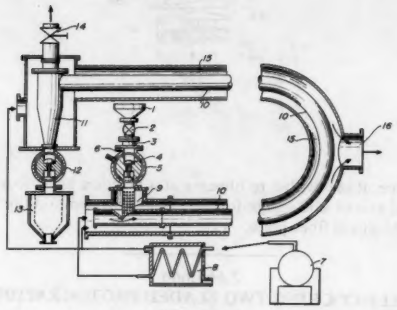
Claims priority, application Japan, Oct. 1, 1968, 43/70808

Int. Cl. A23l *1/18*

U.S. Cl. 99—238 R **2 Claims**

A method of continuously producing an expanded food stuff, which comprises entraining a material food stuff in a pressurized heated gas stream in a suspended condition, thereby heating and conveying said material, and then discharging the heated material into a gas atmosphere at a lower pressure, whereby said material is expanded.

An apparatus for practicing the above-described method, which comprises a conduit for flowing a pressurized heated gas therethrough, means for introducing a material food stuff into the stream of said gas in a suspended condition to be entrained therein, means for collecting the heated material and means for discharging the heated material abruptly into a gas atmosphere at a lower pressure thereby to expand said material.



3,661,072

APPLIANCE FOR THE PREPARATION OF BUTCHER'S MEAT BEFORE CONSUMPTION

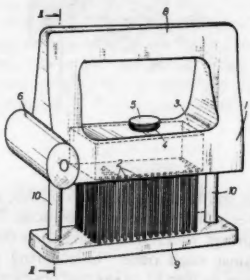
Fernand Michel Allinquant, and Jacques Gabriel Allinquant, both of 53 Avenue Le Notre, Sceaux 92, France

Filed Feb. 13, 1970, Ser. No. 11,145

Claims priority, application France, Feb. 14, 1969, 6903739

Int. Cl. A23l *3/34*

U.S. Cl. 99—256 **3 Claims**



An appliance for the preparation of butcher's meat before consumption comprises the combination of a holder, a plurality of hollow needles arranged in parallel and protruding beneath the holder, a reservoir for a substance which is to be injected into the meat, such reservoir being in communication with the inside of the needles, and means to place the reservoir under pressure. The holder for the needles may be hollow and form the reservoir for the substance which is to be injected and the means for pressurizing the reservoir may comprise a pump delivering atmospheric air into the reservoir.

3,661,073

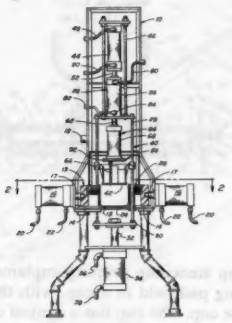
APPARATUS FOR CURING MEAT

Warren R. Schack, Western Springs; Eugene G. Schmoller, Palos Hgts.; Thomas K. Shanks, Chicago, all of Ill., and Philip C. Metzer, Orange, Calif., assignors to Swift & Company, Chicago, Ill.

Original application Dec. 11, 1967, Ser. No. 689,721, now Patent No. 3,565,639. Divided and this application Sept. 2, 1970, Ser. No. 69,098

Int. Cl. A23b *1/01*

U.S. Cl. 99—257 9 Claims



Method of pickling a meat product comprising exerting a compressive force upon the meat product within a container and subsequently reducing the force to a lower positive pressure and thereupon injecting the meat with pickle solution. Apparatus for performing the method comprising positive pressure exerting assembly in combination with an assembly operable to meter desired quantities of pickle and inject the pickle into the meat product.

ERRATUM

For Class 100—37 see:
Patent No. 3,661,082

3,661,074

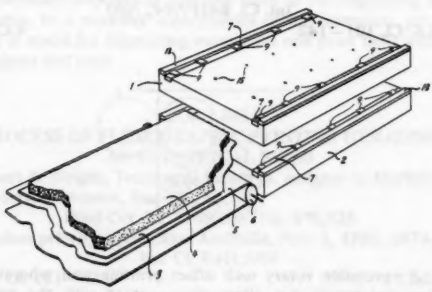
APPARATUS FOR FEEDING AND/OR DISCHARGING A PRESS

Rolf Schweizer, Adliswil, Switzerland, assignor to Fred Fahrni, Zurich, Switzerland

Filed Feb. 25, 1970, Ser. No. 13,910

Int. Cl. B30b *15/30*

U.S. Cl. 100—215 5 Claims



The present invention relates to apparatus for feeding and/or discharging a single- or multi-stage, and preferably heated, press with at least one upper and one lower press plate, between which is passed a flat conductive metal plate or conductive caul with mass to be compressed located thereon. This invention relates in particular to apparatus associated with a heated press for producing wood chip boards, fiber boards, plywood panels, etc. The conductive metal plate acts as the moving portion of a linear induction motor, having a stator which includes a plurality of windings and magnetic cores for converting multi-phase current power into a moving magnetic field which pulls the conductive plate into and out of the press space.

3,661,075

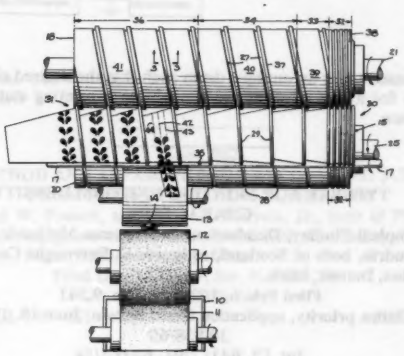
APPARATUS FOR PRINTING ON CURVED SURFACES

Stephen W. Amberg, St. James, N.Y., assignor to Owens-Illinois, Inc.

Filed Dec. 5, 1969, Ser. No. 882,539

Int. Cl. B41f *17/28*, *17/20*

U.S. Cl. 101—40 17 Claims



A printer for cups or similar articles, or articles with a surface of revolution having a straight line generatrix, has a helical printing plate. The articles are advanced along a line parallel to the axis of the plate and the sidewall is imprinted while it follows a substantially helical path. Cups or containers are fed through in partially nested condition.

3,661,076

BELT PRINTING APPARATUS FOR PRINTING LINE OF PRINT AT ONE TIME

Ralph Berger, McLean, Va., and Howard A. Satterlee, Madeira Beach, Fla., assignors to New England Merchants National Bank, Boston, Mass.

Continuation-in-part of application Ser. No. 852,697, Aug. 25, 1969. This application May 25, 1970, Ser. No. 40,170

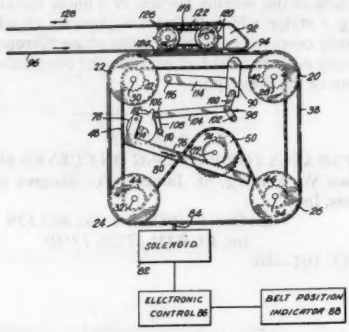
Int. Cl. B41j *9/38*, *1/20*

U.S. Cl. 101—93 C 10 Claims

Printing apparatus is provided in which an entire line of print is printed at one time and wherein a sheet of paper is advanced past a printing station so that a series of lines of printing can be successively printed thereon. The printing is effected in a plurality of parallel columns, with which are aligned a like number of belts on which are located the print characters. These belts are driven by one or more drums in repetitive cycles. In one embodiment, each of the belts is brought to a halt with the desired character at the printing line at the printing station and when a line of print has been thusly compiled, a single hammer unit drives the characters against a ribbon to print the line on the paper. The belts are then returned to an initial position of rest in preparation for the next succeeding cycle for the next succeeding line of print. The print hammer may be actuated from the same source of power which drives the drum or drums and there

may be related to this source of power a stepping device which steps the paper through the printing station.

As an alternative, a plurality of parallel belts are selectively



released to be driven by a drum such that the desired characters for a line of print are brought to a printing station in unison.

3,661,077

TYPEBAR FOR PRINTING UNIFORM DENSITY CHARACTERS

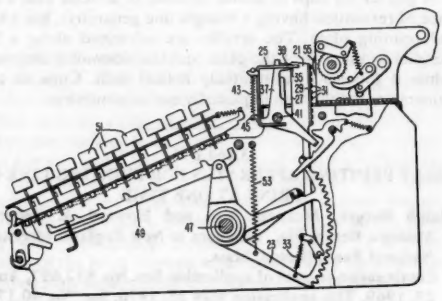
Campbell Findlay, Dumbarton, and Thomas McQuade, Alexandria, both of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 6, 1970, Ser. No. 9,341

Claims priority, application Great Britain, June 18, 1969, 30,838/69

Int. Cl. B41j 7/94; B41f 1/54

U.S. Cl. 101—93 R **5 Claims**



A hammer-impactable and differentially indexible typebar comprising a plurality of type characters of variously dimensioned surface areas is provided with impact control means cooperable with the printing means of a calculating machine and effective for regulating the impacting force of the hammer thereof according to the surface area and location of the selected character to be printed, such regulation serving to assure that all character representations printed by the typebar in an alpha or numeric printer are of such uniform density as to permit satisfactory reading thereof by optical machine-reading equipment. The impact control means of the typebar serves to establish a variable clearance between the hammer and the differentially indexed typebar such that the predetermined firing flight of the hammer will impart a variable striking force of the typebar against a ribbon and a record medium interposed between the selected character and a printing platen.

3,661,078

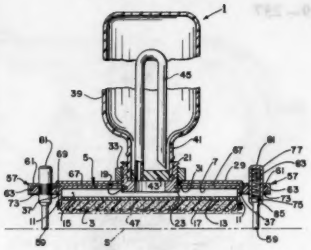
STENCIL HAND STAMP WITH FLUID-CONTAINING HANDLE AND RETRACTABLE SUPPORTS

Larry F. Hammel, Herrin, Ill., assignor to Diagraph-Bradley Industries, Inc., Herrin, Ill.

Filed June 22, 1970, Ser. No. 48,099

Int. Cl. B41k 1/32

U.S. Cl. 101—125 **5 Claims**



A hand stamp stenciling printing implement or duplicator having an inking pad held in a cap, with the pad projecting down below the cap. The cap has a central opening and a tubular stem extending up from the cap in communication with the opening. The stem is internally and externally threaded. A cover plate is provided on top of the cap having an opening receiving the stem. A nut is threaded externally on the stem for clamping the cover plate on the cap. A plastic squeeze bottle containing ink is threaded internally in the stem. Brackets are provided at opposite ends of the cover plate having tongues extending therefrom between the cover plate and the cap and clamped therebetween by the nut, these brackets carrying retractable spring-biased legs for holding the pad raised above a supporting surface, the implement being adapted to be pushed down toward a supporting surface via retraction of the legs against the spring bias.

3,661,079

ROTARY OFFSET PRINTER WITH DAMPING ROLLER SELECTIVELY ENGAGEABLE WITH PRINT CYLINDER OR BLANKET CYLINDER

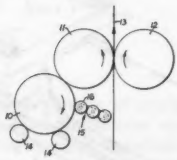
Leonard Ernest Stapleford, Orton Longueville, England, assignor to Baker Perkins Limited, Peterborough, Northampton, England

Continuation-in-part of application Ser. No. 661,901, Aug. 21, 1967, now abandoned. This application Dec. 23, 1968, Ser. No. 788,985

Claims priority, application Great Britain, Sept. 3, 1966, 39,493/68

Int. Cl. B41f 7/04, 7/40

U.S. Cl. 101—142 **4 Claims**



A reversible rotary web offset printing unit wherein the damping means has alternative contact with the printing cylinder after the blanket cylinder and before the inking means, and with the blanket cylinder after the web and before the printing cylinder in forward and reverse running respectively.

3,661,080

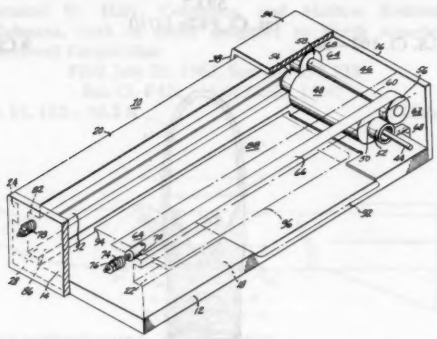
TRAVELING CYLINDER IMPRINTER INCLUDING FLEXIBLE BAND CYLINDER SUPPORT MEANS

Thomas F. Laws, 9806 Laurel Street, Fairfax, Va.

Continuation-in-part of application Ser. No. 789,854, Jan. 8, 1969. This application Nov. 17, 1969, Ser. No. 877,416

Int. Cl. B41f *3/20*

U.S. Cl. 101—269 **17 Claims**



An imprinting device is disclosed wherein the imprinter roller assembly is loosely connected to the assembly carriage, the imprinter roller being supported at each end thereof by a roller cluster. Each roller cluster is supported by a flexible metal band, the band being fixedly connected at one end of the imprinter and adjustably connected at the other end thereof, each band being confined at the top and bottom thereof by a channel disposed along the imprinter length, the bottom of each channel being disposed above the upper surface of the print bed. Each band passes over and around one of the rollers of its associated roller cluster and then around and under the other roller of its associated cluster. The corresponding rollers of each cluster are connected together by appropriate means. The points where the bands are fixedly connected to one end of the imprinter are respectively disposed immediately above the bottoms of the above-mentioned channels. The print bed is provided with a recess for receiving the printing plate or card prior to the imprinting operation. A document or invoice is placed over the printing plate and onto the print bed. The documents and printing plate are respectively inserted through elongated apertures respectively disposed at opposite sides of the imprinting apparatus. In a modified embodiment of the invention, provision is made for imprinting more than one print field within the print bed area.

3,661,081

PROCESS OF FLEXOGRAPHIC PRINTING UTILIZING AN ELECTRICAL FIELD

Robert J. Wright, Tranmere, Australia, assignor to Hurletron Controls Division, Danville, Ill.

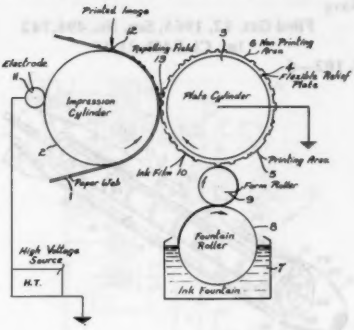
Filed Oct. 22, 1969, Ser. No. 870,525

Claims priority, application Australia, Nov. 1, 1968, 45744

Int. Cl. B41f *5/04*

U.S. Cl. 101—426 **4 Claims**

A process for flexographic printing in which ink transfer between the plate cylinder and the web which passes over the impression cylinder is controlled by an applied electrical field between the impression cylinder and the plate cylinder in a direction such that a polarity sensitive flexographic printing ink is moved away from the web towards the plate cylinder whereby only contact areas between the plate cylinder image



and the web will receive printing ink due to the mechanical contact.

3,661,082

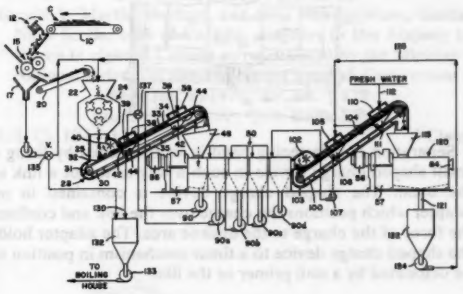
METHOD AND APPARATUS FOR RECOVERING JUICE FROM SUCROSE BEARING MATERIALS

Alfred W. French, and Forest J. Starrett, Jr., both of Piqua, Ohio, assignors to The French Oil Mill Machinery Company, Piqua, Miami County, Ohio

Filed Dec. 18, 1969, Ser. No. 886,178

Int. Cl. B30b *9/14*

U.S. Cl. 100—37 **15 Claims**



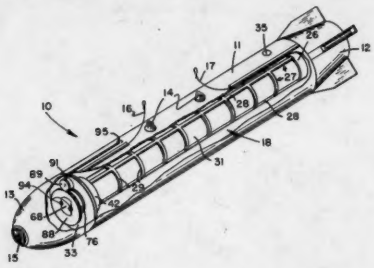
Sucrose bearing materials, such as raw sugar cane, are shredded and then subjected to application of maceration liquid to penetrate the liquid into the ruptured cells of the material. Following this operation, the saturated material is conveyed through a mechanical screw press having sequentially arranged drainage cage sections in each of which juice combined with maceration liquid is expressed from the material. The material leaving the press is subjected to a further treatment with maceration liquid, preferably fresh maceration water, and then the material is processed through the dewatering stage, such as a high pressure dewatering screw press, after which the spent bagasse is disposed of in any suitable manner. In the first screw press, the liquids extracted at various points in the sequential cage sections are recirculated in countercurrent fashion to preceding stages of the press, and liquids from the first stage of the press are recirculated to the material entering the press from the shredding stage.

3,661,083

DEVICE FOR RAPIDLY MIXING AND AGITATING CHEMICALS IN SEALED CONTAINERS

James E. Weimholt, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 12, 1965, Ser. No. 496,742
Int. Cl. F42b 25/12
U.S. Cl. 102—6 7 Claims



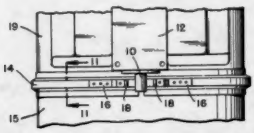
The invention comprises an apparatus for maintaining liquid and dry chemicals safely separate in hermetically sealed containers and for rapidly mixing and agitating the chemicals in flight just prior to launch of the munition.

3,661,084

BAND RELEASE

Ronald C. Noles, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 3, 1969, Ser. No. 855,011
Int. Cl. F42b 3/08
U.S. Cl. 102—24 HC 2 Claims



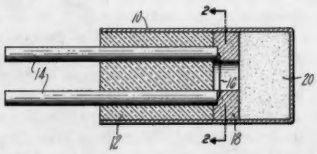
Separation of a fastening band is accomplished by firing a small shaped charge device in such a way as to cut a link in the band. The shaped charge device is contained in an adapter which positions the charge over the link and confines the force of the charge to the desired area. The adapter holds the shaped charge device to a timer mechanism in position to be detonated by a stab primer or the like.

3,661,085

ELECTRICALLY ACTUATED INITIATOR

William M. Smith; Thomas W. Norton, both of Simsbury, and John D. Hawley, East Hartland, all of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Sept. 19, 1969, Ser. No. 859,336
Int. Cl. F42b 3/12
U.S. Cl. 102—28 7 Claims



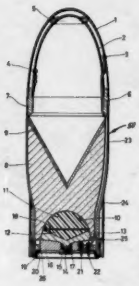
A fast response electrically actuated pyrotechnic or explosive initiator includes an initiating charge in contact with only those portions of a bridge wire located immediately adjacent the area of wire contact with the terminal posts.

3,661,086

HOLLOW CHARGE CONSTRUCTION

Franz R. Thomanek, Sandizell; Georg Lallinger, Muhlried, and Hermann Rosner, Meitingen, all of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed June 16, 1969, Ser. No. 833,558
Claims priority, application Germany, June 14, 1968, P 17 03 593.7
Int. Cl. F42b 13/10
U.S. Cl. 102—56 9 Claims



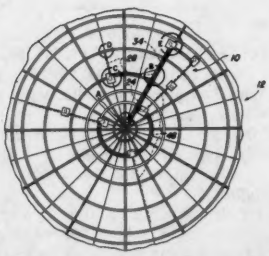
A hollow charge construction in the form of a missile includes a symmetrical explosive charge having a conical forward liner and a rear spherical recess carrying an inert insert made of a material such as silicon rubber and providing guidance of the detonation waves. A detonator is arranged in the axis of rotation of the explosive charge cavity and the conical hollow charge liner and the inert insert which is arranged in the conical cavity. The explosive charge is enclosed by an aerodynamically designed cylindrical housing with a double hood portion. The detonating device is actuated by contact between the outer and inner hood walls and by transmission of a detonating pulse through an electric line which traverses the hollow charge in a longitudinal direction. The detonator in a form of a compressed charge is held centrally within a rear closing cover of the housing. The inert insert is made up of many parts having intersecting surfaces which extend at right angles to the axis of rotation of the charge.

3,661,087

FLARE DEPLOYMENT SYSTEM

Robert C. Willard, China Lake; Harold L. Dauer, and Ronald Clifford Noles, both of Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 11, 1969, Ser. No. 884,084
Int. Cl. F42c 9/14
U.S. Cl. 102—70 R 1 Claim



The deployment of a hot air suspended flare system is enhanced by a time delay venting and destruct system. As the

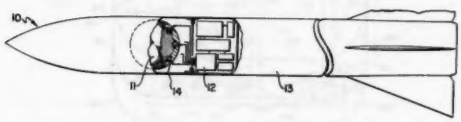
balloon is deployed with the aid of a drogue chute, a lanyard attached to the chute extracts a safety wire from a firing device which ignites a length of safety fuze proportioned to ignite a first segment of stranded propellant after a predetermined time for cutting a vent in the balloon and at the same time igniting a second proportioned length of safety fuze. The second length of safety fuze, in turn, ignites a second pattern of stranded propellant which completely destroys the lifting power of the balloon.

3,661,088

WARHEAD SYSTEM

Raymond W. Harr, Columbus, and Mathew Rothman, Gahanna, both of Ohio, assignors to North American Rockwell Corporation

Filed July 25, 1963, Ser. No. 297,525
Int. Cl. F42c *11/00, 13/00, 15/40*
U.S. Cl. 102—70.2 R **3 Claims**



1. In a warhead system, in combination:
   b. More than one detonator device each of which is spaced-apart from the others and located in cooperating relation to said explosive charge and each of which is exploded only by a high-voltage electrical energy charge,
   c. Storage means operable to contain a high-voltage electrical energy charge,
   d. A trigger control means which is connected to said storage means and which conducts a high-voltage electrical energy charge only when activated by a separate low-voltage electrical energy charge,
   e. More than one interlock control means each of which connects one of said detonator devices in conducting relation to said trigger control means and each of which conducts a high-voltage electrical energy charge only when activated by a separate low-voltage electrical energy charge,
   f. First conductor means which conducts an activating low-voltage electrical energy charge to each of less than all of said interlock control means to thereby impart selected directionality to the explosion of said explosive charge caused by said detonator devices, and
   g. Second conductor means which conducts an activating low-voltage electrical energy charge to said trigger control means thereby causing high-voltage electrical energy to be conducted from said storage means simultaneously to those detonator devices which cooperate with the interlock control means activated by said first conductor means.

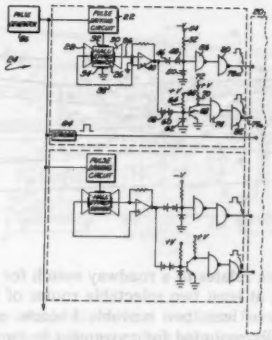
3,661,089

CONTROL SYSTEM EMPLOYING HALL-EFFECT DEVICES

Daniel J. Soltz, Norristown, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 3, 1970, Ser. No. 16,023
Int. Cl. B61k *1/00*
U.S. Cl. 104—88 **4 Claims**

An automated vehicle which moves along a path is to perform certain tasks at predetermined locations along the path in accordance with codes sensed by a code reader from code magnets located at sensing stations along the path. The code reader contains a number of Hall-effect devices for sensing the orientation of the code magnets. The voltage output of each Hall-effect device is coupled to a differential amplifier. The output of each differential amplifier is coupled to a first threshold circuit which produces a first logic level signal when the output of the differential amplifier has a positive



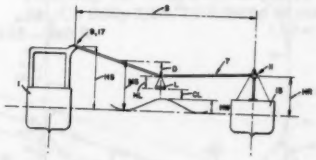
polarity and to a second threshold circuit which produces a second logic level signal when the output of the differential amplifier has a negative polarity. A pulse generator may be coupled to a pulse driving circuit to supply current pulses to the Hall-effect devices so that the sensitivity of the Hall-effect devices is increased.

3,661,090

LATERAL LOAD TRANSFER

Gerald Y. Martin, Bedford, and John Murray Vines, Halifax, Nova Scotia, both of Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defense of Her Majesty's Canadian Government

Filed Jan. 9, 1970, Ser. No. 1,579
Int. Cl. B61b *7/02, 7/04;* **B63b** *27/08*
U.S. Cl. 104—114 **8 Claims**

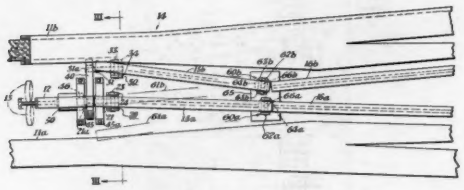


This application discloses a system for transferring loads laterally between two ships at sea. It makes use of a modification of the known "high line" wire which carries a traveller supporting the load and is moved to and fro by "outhaul" and "inhaul" wires attached to the traveller. In the modification, a single cable is used which acts as the high wire and returns round a pulley as the "low wire" being anchored at the traveller. The low wire can be divided at the traveller if desired. The "loose" end of the lower wire is wound on a winch which serves to transfer the load. The geometry of the wires at the traveller tends to keep the load at a constant distance above the water despite relative movements of the two ships.

3,661,091
SINGLE GUIDE MEMBER TRANSIT VEHICLE SWITCHING MECHANISM

Peter M. Noble, Valencia Township, Butler County, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Dec. 23, 1969, Ser. No. 887,615
Int. Cl. E01b *25/12, 7/04*
U.S. Cl. 104—130 12 Claims

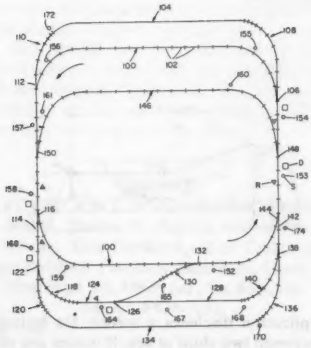


This disclosure relates to a roadway switch for self-guided vehicles having at least two selectable routes of travel. The switch includes at least two movable I-beams each having one end pivotally mounted for movement in two modes. A rotatable member supports the outer end of each of the movable I-beams and permits movement of the other end of the I-beams in three modes. An electric motor is incorporated for rotating the rotatable member between a first and second position whereby one of the I-beams establishes the route of travel for the self-guided vehicles.

3,661,092
TRANSPORTATION SYSTEM

Richard E. Morley, Bedford, and Michael P. Greenberg, Winchester, both of Mass., assignors to Alden-Self-Transit Systems Corporation, Bedford, Mass.

Filed Dec. 5, 1969, Ser. No. 882,422
Int. Cl. B60l *15/00*
U.S. Cl. 104—148 R 22 Claims

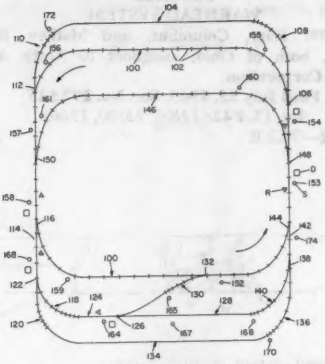


A transportation system has a predetermined path along which vehicles move, which path is divided into a series of discrete control areas. The vehicles move along the path in synchronism with one another under system vehicle velocity control. A supervisory control which includes a series of storage registers, including a register corresponding to each control area on the path, store signals representative of vehicle information, and those vehicle information signals are moved through the storage registers in synchronism with the movement of the vehicles along the path.

3,661,093
TRANSPORTATION SYSTEM

Campbell L. Searle, Weston, Mass., assignor to Alden Self-Transit Systems Corporation, Bedford, Mass.

Filed Dec. 5, 1969, Ser. No. 882,423
Int. Cl. B60l *15/00*
U.S. Cl. 104—148 R 5 Claims

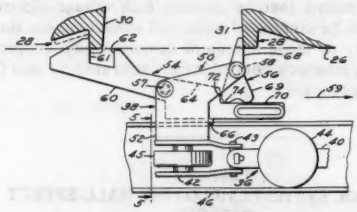


A transportation system has a predetermined path along which vehicles move. Signals are generated that effectively define a series of control areas that circulate along the path. Each control area includes a propulsion control portion and a sense portion, and the vehicles include circuitry responsive to the propulsion control portions for maintaining vehicle movement along the path in synchronism with the movement of the control areas. Should a vehicle be detected in a sense portion of the control area, a warning signal is generated.

3,661,094
CONVEYOR SYSTEM FOR TRAYS

Martin Pachuta, Allen Park, Mich., assignor to Jervis B. Webb Company

Filed Jan. 21, 1970, Ser. No. 4,633
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 B 14 Claims



A conveyor system in which carriers such as trays are propelled along a support by pusher units on an endless driven chain and can be stopped, accumulated and transferred from one chain to another. Each pusher unit includes a pusher member engageable with a driving flange on a carrier and retained in driving position by a locking member which projects into the path of carrier movement in advance of the pusher member and the carrier driven thereby and is

engageable with an object in the path of movement to release the pusher member and permit the stopping and accumulation of carriers.

3,661,095

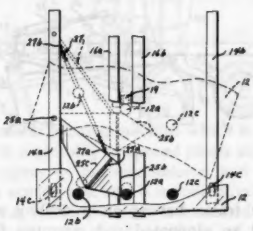
CONVEYOR ACCESSORY

Robert F. Pate, Elberfeld; Gilman Tredwell, and William S. Mitchell, both of Evansville, all of Ind., assignors to George Koch Sons, Inc., Evansville, Ind.

Filed July 30, 1969, Ser. No. 846,197

Int. Cl. B61b *7/00*

U.S. Cl. 104—172 B **4 Claims**



An accessory for a floor type pallet conveyor system characterized by a pivotal member selectively engaged by a pallet pin and at least one pallet positioning pin to align the pallet into a proper position for movement.

3,661,096

MOTORIZED RESILIENT DRIVE RAILWAY TRUCK

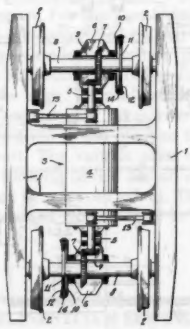
Ulrich Kayserling, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Germany

Filed May 19, 1969, Ser. No. 825,804

Claims priority, application Austria, June 12, 1968, A 5631/68

Int. Cl. B61c *9/44, 9/52;* **B61f** *3/04*

U.S. Cl. 105—117 **3 Claims**



A motor transversely stabilized by links connected to the truck frame is mounted between two axles in a railway vehicle frame and having a drive shaft for each axle elastically coupled to its axle.

3,661,097

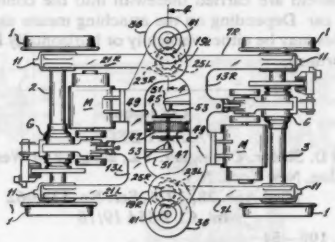
RAILWAY VEHICLE ARTICULATED TRUCK

Keith L. Jackson, Granite City, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Oct. 6, 1969, Ser. No. 864,012

Int. Cl. B61f *3/04, 5/14, 5/20*

U.S. Cl. 105—199 R **20 Claims**



A railway vehicle four-wheel truck has framing comprising separate longitudinally extending side frames carried at their ends by the axles and each having a rigid transverse transom between the axles, the individual side frame transoms being offset from each other longitudinally of the truck except for their outer extremities which are aligned transversely of the truck and extend across the opposite side frames, on which they are supported to pivot about a common transverse axis. Outboard of each side frame, the extremity of the opposite side frame supports an upright elastomeric spring, on which the vehicle body is seated, and the springs are yieldable horizontally as well as vertically to accommodate lateral and swivel movements. At its center the truck framing is connected to the body by a draft-transmitting device capable of permitting such transverse, vertical and swivel movements of the body and truck with respect to each other.

3,661,098

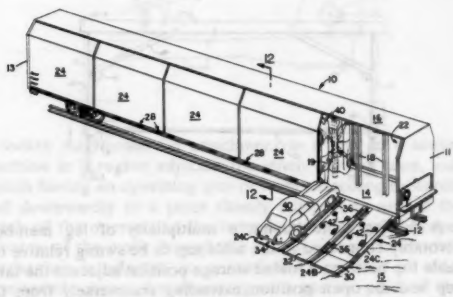
APPARATUS FOR SHIPPING AUTOMOBILES

William M. Jaekle, 18 Tarry Lane, Orinda, Calif.; Paul V. Garin, 1836 Lake Street, San Francisco, Calif.; William E. Thomford, 1176 Glenwood Drive, Millbrae, Calif.; Wallace M. Greb, 1139 Oakes Boulevard, San Leandro, Calif., and Nicholas N. Udaloff, 141-16th Avenue, San Francisco, Calif.

Filed Aug. 14, 1969, Ser. No. 850,107

Int. Cl. B60p *3/06, 7/08;* **B60d** *45/00*

U.S. Cl. 105—360 R **8 Claims**



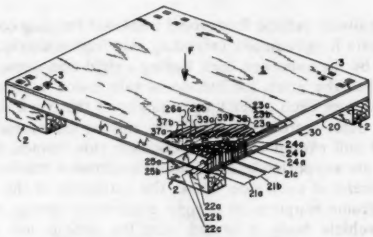
A railway car has a roof portion, a floor portion and side wall portions. Each side wall portion is made up of a plurality

of door portions pivotally fixed relative to the floor portion. The door portions, when pivoted upward, form the side wall portions, with the top edges thereof adjacent the roof portion, and, when pivoted downward, have edges adjacent the ground so that automobiles may be driven thereon. Attaching means are included with the door portions and with the automobiles so that the automobiles may be fixed thereto, with the wheels of the automobiles against the door portions. When the door portions are pivoted upward, the automobiles fixed thereto are carried therewith into the confines of the railway car. Depending on the attaching means used, the automobiles may be either vertically or horizontally fixed to the door portions.

3,661,099
PALLET DECK

Clifford D. Shelor, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 28, 1971, Ser. No. 138,062
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **10 Claims**

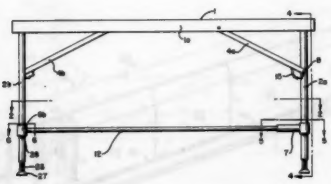


Shipping pallet for large, high density loads having a load receiving deck fabricated entirely from corrugated paper board by adhesively securing a multiplicity of juxtaposed corrugated board strips, flute axes perpendicular to the deck surface, to form a core; and sandwiching said core between corrugated board sheets, flute axes parallel to said deck surface.

3,661,100
FOLDING TABLE

Charles E. Tennant, Collinsville, Ill., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 5, 1968, Ser. No. 757,593
Int. Cl. A47b *3/091*
U.S. Cl. 108—132 **3 Claims**

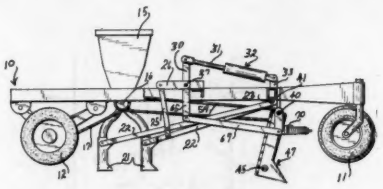


A folding table having a multiplicity of leg members pivotably connected to the table top to be swung relative the table top between a folded storage position adjacent the table top and an open position extending transversely from the table top to support the table in standing position. Sleeve means are provided to slide on selected leg means and a leg brace assembly is provided to be connected to such sleeve means so the leg brace assembly can be moved along the leg means relative to the table top. The leg brace assembly is also received by selected sleeve means so the overall length of the leg brace assembly is decreased to allow the legs to be pivoted to a folded position adjacent the table top.

3,661,101
GRAIN DRILL WITH ROD WEEDER

Billie D. Parsons, Milesville, S. Dak.

Filed Dec. 22, 1969, Ser. No. 886,975
Int. Cl. A01c *7/18*; A01b *39/19*
U.S. Cl. 111—69 **2 Claims**

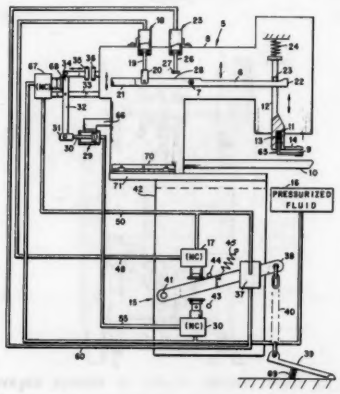


A mobile frame having grain drilling apparatus affixed thereto and an elongated rod mounted for rotation in a horizontal orientation so as to preceed the grain drill shoes but follow all wheels and the like which preceed the grain drill shoes. The rod is mounted to travel a short distance below the surface of the soil and prepare the soil for the grain drill.

3,661,102
CONTROL SYSTEM FOR CYCLICALLY OPERATED STITCHING MACHINES HAVING A DUAL PRESSER FOOT

Richard F. Tice, 4022 Doris Circle, Knoxville, Tenn.

Continuation-in-part of application Ser. No. 739,254, June 24, 1968, now Patent No. 3,565,024. This application Nov. 6, 1970, Ser. No. 87,405
Int. Cl. D05b *3/12, 69/08*
U.S. Cl. 112—67 **8 Claims**



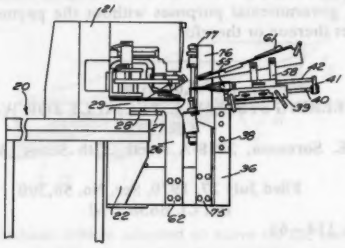
A control system for cyclically operated stitching machines having a dual presser foot wherein the functions of presser foot manipulation and machine starting are brought about by movement of a single operator control.

3,661,103

AUTOMATIC PLEATING MACHINE

Harry Firestein, Mamaroneck, N.Y., and Karl Tyas, Ocean Grove, Mass., assignors to Louis Hand Incorporated, Fall River, Mass.

Filed Nov. 2, 1970, Ser. No. 86,025
Int. Cl. D05b *35/08*
U.S. Cl. 112—134 35 Claims



This is an automatic pleating machine which is designed to automatically form a plurality of spaced pleats across the top of a piece of drapery or curtain material and to sew the pleats in place. A sewing machine is mounted on a stand and the automatic pleat forming device is mounted on an arm swung from beneath the stand in front of the sewing machine. A pair of jaws are pivoted to swing vertically into open position with a central tongue between them to form two separate sections. A C-shaped arm is designed to push the material into jaws on each side of the central tongue to form the pleat. A plurality of needles now swing upwardly through slots in the jaw to hold the pleat in position while the C-shaped device is removed. The jaws then close on the pleat and the entire jaw assembly moves forwardly to a point beneath the sewing machine needle. At this point the sewing machine clamp moves downwardly and clamps the pleat. The jaws are then withdrawn and opened up for the formation of another pleat. The second pleat is formed before the first pleat has been sewed by the machine. After the first pleat has been sewed the sewing machine clamp is raised and an arm comes downwardly to pull the material from beneath the needle of the sewing machine. The second pleat already completed in the jaws is then moved forwardly beneath the sewing machine clamp. This is repeated until the plurality of predetermined pleats in a predetermined spaced relation are formed on the material. The pleats are usually so arranged that the first and last pleats are approximately 3 inches from the edge of the material while the other pleats are approximately five inches apart. For this construction the apparatus is provided with an arm controlled by two cams. During the initial operation the first cam permits the arm to move downwardly to pull sufficient material to form the first pleat three inches from the edge. Thereafter during the operation of the device the second cam takes over and pulls more material for the formation of the pleat so that the pleats are now five inches apart. The various parts of the device the jaws and the pleat forming device are all operated by compressed air controlled by solenoid valves. The entire machine can then be programmed from a tape in the conventional manner.

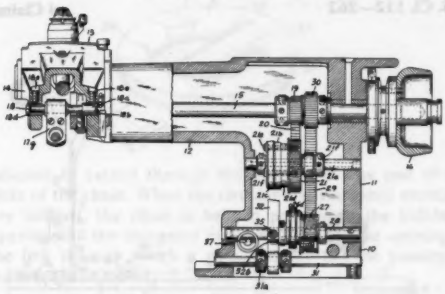
3,661,104

HIGH SPEED BLINDSTITCH SEWING MACHINE

Roy W. Fletcher, Riverdale, and Anthony D. Forte, Chicago, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed Aug. 19, 1968, Ser. No. 753,654
Int. Cl. D05b *1/24*
U.S. Cl. 112—178 8 Claims

Vibration and noise reducing features are provided in a blindstitch sewing machine and its supporting means, thereby enabling the machine to perform proper stitching at much higher speeds. Includes reduction in size and weight of connection from a rotary drive shaft to a node former for oscillating the latter. Use of toothed pulleys and belt connections from a main drive shaft to two rotary members on stationary or non-rotary shafts, which members serve to operate various devices within the machine to enable it to produce a continuous series of regular, non-skip stitches of seams involving



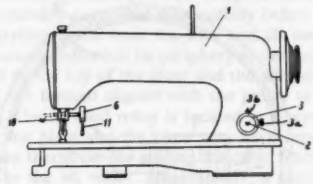
both skip stitches and non-skip stitches, by appropriate adjustment of certain parts. Involves also the provision of special means for mounting the sewing machine on a supporting table and securing the machine thereto. Means are included in the machine structure for firmly retaining both ends of an eccentric shaft which serves to support and control the movement of a looper during stitch forming operations. This has also required changes in the form of the feed bar employed.

3,661,105

SWITCH UNIT FOR CONTROLLING OPERATION OF PARTS OF OR ACCESSORIES FOR SEWING MACHINES

Gunther Rohr, Stuttgart, Germany, assignor to Union Special Maschinenfabrik G.m.b.H., Stuttgart, Wurttemberg, Germany

Filed Jan. 8, 1968, Ser. No. 696,393
Claims priority, application Germany, Jan. 10, 1967, P 16 85 071.8
Int. Cl. D05b *27/00, 69/00*
U.S. Cl. 112—210 11 Claims



Switch mechanism for attachment as a unit to a sewing machine in a region adjacent the stitch forming zone, said switch having an operating arm or lever extending forwardly and downwardly to a point closely adjacent to one of the hands of the operator as the latter is assisting in the proper advance of the work through the stitching zone. Said switch mechanism is adapted to control the operation of electromagnetic means for operating said part or parts of the sewing machine, such as the feed mechanism thereof, such control being adapted to reverse the direction of feed of the feed mechanism to produce locking of one or both of the ends of a line of stitching being formed. It is also adapted for use in operating other devices provided as a part of or an ac-

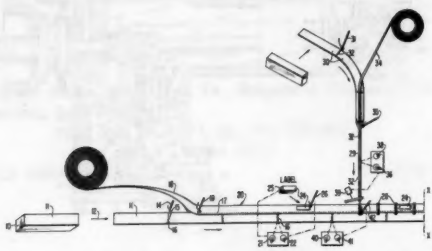
cessory for sewing machines, such as thread, thread chain, and tape cutting devices.

3,661,106

GARMENT PARTS WITH DETECTABLE STITCHING

Erie G. Huddelston, Monroe, Ga., assignor to Oxford Industries Inc.

Filed Aug. 21, 1969, Ser. No. 851,921
Int. Cl. D05b *1/00, 23/00*
U.S. Cl. 112—262 **4 Claims**



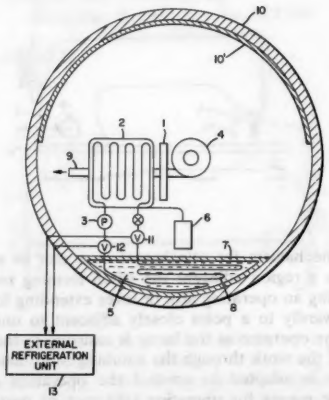
Garments are formed with stitching which carries a substance detectable when illuminated by ultra-violet light. When the stitching is detected in a process of making garments, subsequent garment making steps are actuated in response to the detection of the stitching.

3,661,107

LIFE SUPPORT SYSTEM FOR DEEP SUBMERSIBLE VEHICLES

Richard M. Jacobs, Baton Rouge, La.; Dave W. Alexander, Houston, Tex., and Charles M. Gronroos, Vallejo, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 28, 1970, Ser. No. 101,789
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 R **7 Claims**



A cooling system for a deep submersible vehicle having a cabin and a false floor. The cooling medium of the cooling system has a high specific heat and is stored in the normally unused space beneath the false floor. The cooling media is super-cooled or frozen by the refrigeration system of a mother ship. One heat exchanger is located in the cooling medium and another heat exchanger is located in the crew department of the cabin. A circulation system is provided between the two heat exchangers. Heat for the vehicle is provided by the vehicle passengers, electric equipment, a CO_2 scrubber and a heater if required.

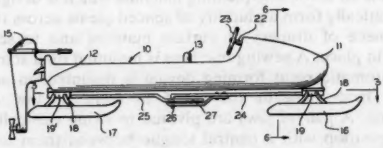
The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

3,661,108

STEERING SYSTEMS ESPECIALLY FOR WATER CRAFTS

Hugh E. Sorenson, 3818-A North 37th Street, Milwaukee, Wis.

Filed July 27, 1970, Ser. No. 58,300
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **7 Claims**



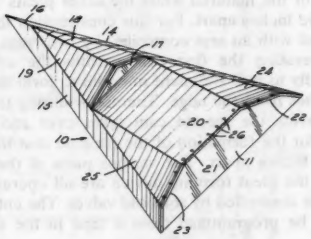
A vehicle is supported at each of its four corners by any suitable means, such as hydrofoils, pontoons, wheels, skiis, or the like. At both the front and back, oppositely disposed supports are rigidly interconnected and the rigid connection is pivotally attached to the vehicle body or hull. A tongue is individually associated with each of the rigid interconnections and the tongues are pivotally interconnected to simultaneously turn both the front and back supports.

3,661,109

BOAT HULL

Carl W. Weiland, 2980 Interlaken, Orchard Lake, Mich.

Filed Apr. 27, 1970, Ser. No. 32,287
Int. Cl. B63b *1/20*
U.S. Cl. 114—66.5 R **4 Claims**

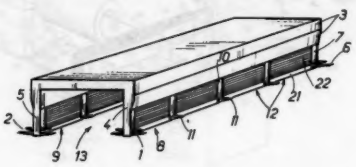


A straight-line boat hull structure of delta shape which is constructed of planar panels set at angles of attack to the water to engage the water as inclined plane lifting ramps to raise the hull in conjunction with forward movement. The panels are set at compound angles to one another creating a truss structure of inherent mechanical strength. Side panels and a transom panel define the delta shape. The side panels intersect at the prow. Bottom fore panels, a bottom aft panel, and bottom aft bilge panels form a bottom structure between the side panels and transom panel in conjunction with a hydroplane step cross panel midway in the hull.

3,661,110
FLUID CUSHION MACHINES

Dominique Etienne Louis Pont, Garches, France, assignor to Societe D'Etudes et De Developpement Des Aeroglisseurs Marius Terrestres et Amphibies S.E.D.A.M., Paris, France

Filed Oct. 15, 1970, Ser. No. 81,050
Claims priority, application France, Oct. 17, 1969, 6935675
Int. Cl. B63b *1/28, 1/38*
U.S. Cl. 114—66.5 H 18 Claims

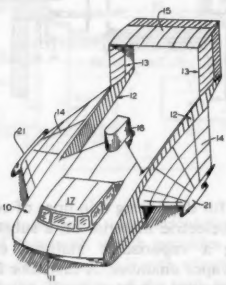


An air cushion vehicle adapted to move on the surface of water and comprising in combination stabilizing hydrofoils transmitting to the vehicle structure hydrodynamic lift forces co-operating with one or more fluid cushions to lift and stabilize the vehicle, and further hydrofoils which maintain the bottom edge of the lateral boundary walls for the fluid cushion near the water surface.

3,661,111
AEROFOILBOAT

Alexander M. Lippisch, 1416 Oakland Road, Apt. 6, Cedar Rapids, Iowa

Filed Oct. 24, 1969, Ser. No. 869,124
Claims priority, application Germany, Oct. 25, 1968, P 18 05 171.3
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A 7 Claims



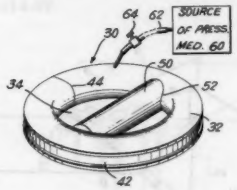
An aerofoilboat shaped with a concavity extending back from the bow, open at the front in the direction of forward motion and generally bounded at the sides and around the rear between the sides by the water surface, and with sufficient forward speed the aerofoilboat being raised and supported above the water surface primarily through an air cushion thereunder built up due to surface ground effect with forward motion of the aerofoilboat. It has a longitudinally shifting center of lift that moved toward the rear in a self adjusting trimming action as the boat moves higher and ground effects lift is lessened.

3,661,112
ANCHOR STORAGE AID

Olav Angell, 880 59th Street, Brooklyn, N.Y.

Filed Jan. 29, 1971, Ser. No. 110,866
Int. Cl. B63b *21/18*
U.S. Cl. 114—200 9 Claims

An anchor storage aid for supporting an anchor chain in an opening in the bulkhead of a chain locker. The storage aid includes a circular inflatable member peripherally engaged in the opening of the bulkhead and provided with a generally circular opening which with the member deflated permits the free passage of the chain therethrough. An elongated inflatable member is provided on the circular member and is

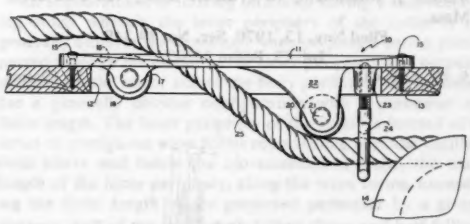


adapted to extend through the opening in one end of the links of the chain. When the circular and elongated members are inflated, the chain is held in position in the bulkhead opening and the elongated member obturates the opening in the link through which it passes to prevent the passing of water into the locker.

3,661,113
ROPE TRAVERSE DEVICE

Frank A. Benedict, 316 South Orchard Road, Syracuse, N.Y.

Filed June 15, 1970, Ser. No. 46,147
Int. Cl. B63b *21/24*
U.S. Cl. 114—206 R 1 Claim



A traverse device for passing an above deck anchor rope or cable through a small opening in the deck to a below deck windlass or fastening, has a plate covering the deck opening and rollers rotatably supported substantially below the plate by ears projecting down from the fore and aft ends of the plate. The forward roller has its periphery at the top substantially tangent to the top of the plate and the aft roller has its periphery at the bottom aligned with the pulley or drum of the windlass. The forward roller is located in a rope guiding slot through the plate and the plate may have rope guiding means pendant therefrom for guiding the cable from the windlass pulley to the aft roller. Alternatively, a grooved slide may replace the aft pulley.

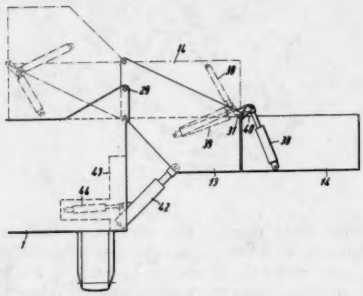
3,661,114
AMPHIBIOUS VEHICLE

Gerhard Wagner, Mainz-Lerchenberg; Friedrich Kroll, Mainz; Horst Gleich, Heilbronn-Bockingen, and Georg Kessler, Oberwesel, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Koln-Deutz, Germany

Filed June 8, 1970, Ser. No. 44,025
Claims priority, application Germany, June 10, 1969, P 19 29 246.7
Int. Cl. B60f *3/00*
U.S. Cl. 115—1 B 15 Claims

An amphibious vehicle having an elongated bouyant main body with ground wheels at the ends for ground travel and

propulsion means for water travel. Auxiliary bouyant bodies on top of the main body can be pivoted outwardly thereon at opposite sides of the main body to form a platform for ferrying or for a bridge. When the auxiliary bodies are pivoted inwardly on top of the main body, the vehicle is compact and



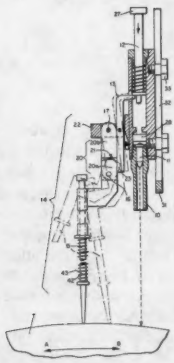
can be transported in a rail car. When the auxiliary bodies are pivoted outwardly, a wide platform is provided. Differing positions for use are realized by folding operations relative to the auxiliary bodies with pure pivoting movements. Land vehicle use, floating body use, and ramp use are feasible in compact and folded apart configurations of auxiliary bodies.

3,661,115

VEHICLE THEFT ARRESTER

Abraham J. Rosenstein, 14 Prospect Lane, New Marlboro, Mass.

Filed Nov. 13, 1970, Ser. No. 89,349
Int. Cl. B60m *25/00*
U.S. Cl. 116—33 **10 Claims**



A sensing device detects initial movement of the vehicle and actuates a trigger mechanism of a device which is aimed to shoot a projectile to deflate and destroy the tire.

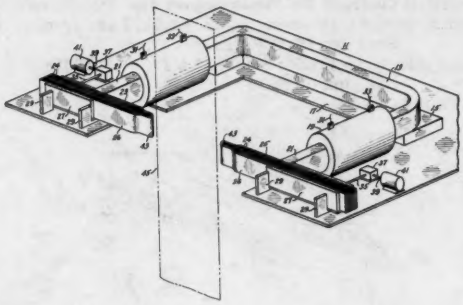
3,661,116

MAGNETIC STABILIZING MEANS FOR STRIP

Isadore Moskowitz, and George F. Lemon, Jr., both of Baltimore, Md., assignors to Bethlehem Steel Corporation

Filed Nov. 23, 1970, Ser. No. 91,721
Int. Cl. B05c *11/12*
U.S. Cl. 118—6 **15 Claims**

Tapered poles of an electromagnet are positioned adjacent the edges of a magnetic metal strip as it passes from the sur-



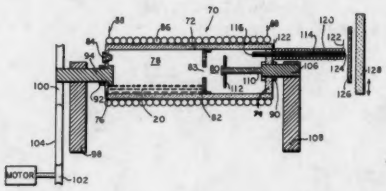
face of a coating bath or the like to stabilize the strip against flutter and other lateral stability disturbing influences.

3,661,117

APPARATUS FOR DEPOSITING THIN LINES

William L. Cornelius, Mountain View, and John G. Martner, Atherton, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Dec. 3, 1969, Ser. No. 881,746
Int. Cl. C23c *13/12*
U.S. Cl. 118—48 **8 Claims**



An apparatus for depositing thin lines of conducting, semiconducting or dielectric material on a substrate including a crucible having a vaporizable material charge receiving chamber and a vapor chamber. A first tube for introducing a flow of carrier gas and a heated capillary tube penetrate the vapor compartment. On heating the crucible to a temperature above the evaporation temperature of the charge, the charge evaporates and is pushed through the capillary tube by the carrier gas. The stream of carrier gas and vapor deposits dots or lines on the target. Patterns are produced by translating the target with respect to the crucible.

3,661,118

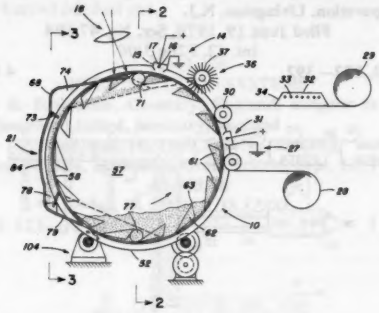
ELECTROSTATIC DEVELOPMENT

Stephen F. Royka, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,269
Int. Cl. G03g *13/00*
U.S. Cl. 118—636 **11 Claims**

Electrostatographic development apparatus in which developer is stored in the interior of a movable recording member, such as a rotatable drum. The interior of the drum is provided with buckets which are rotated therewith and scoop developer from the lower portion of the drum and convey the developer to an upper portion of the drum at which

point the developer is removed from the interior of the drum and cascaded over the recording surface. The developer



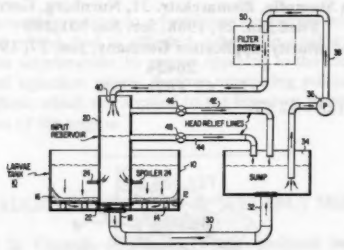
which has cascaded over the surface is then returned to the interior of the drum.

3,661,119

LARVAE REARING TANK AND CIRCULATION SYSTEM FOR FISH CULTURE

Graham Hodge Sanders, Elizabeth City, N.C., assignor to Oceanography Mariculture Industries, Inc., Riviera Beach, Fla.

Filed Sept. 11, 1970, Ser. No. 71,512
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 **8 Claims**



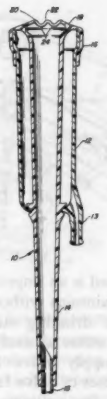
A larvae rearing tank and a water circulation and filtration system associated therewith which provides a high rate of water exchange in the larvae tank with minimum turbulence and water flow in the direction of the tank walls, thereby to provide optimum conditions within the tank for insuring survival of the fish larvae therein. The larvae tank includes a granular layer of filtrant material supported in spaced relation from its bottom end, an outlet pipe for discharging water from the bottom end, and an input reservoir for supplying water thereto above the level of the granular filtrant material. The reservoir is embodied in a container of smaller cross-sectional area than the larvae tank which is positioned within the tank and has a plurality of horizontally extending hollow rods which are sealed on the ends thereof and have a plurality of small holes therein through which the water is transferred from the reservoir to the larvae tank with an initial circular flow pattern. Water from the outlet of the larvae tank is pumped to a sump positioned at substantially the same level as the larvae tank, and from there it is pumped through a filter system and discharged into the top of the input reservoir, whereby the input rate of water being delivered to the larvae tank is determined by the pressure head in the input reservoir created by the height of the filtered water therein which, in turn, is controlled by a valved head-relief line leading to the output sump.

3,661,120

MILKING INFLATIONS

Don F. Siddall, Akron, and Vincent L. Hoffman, Summit, both of Ohio, assignors to The Norton Company, Worcester, Mass.

Filed Feb. 6, 1970, Ser. No. 9,197
Int. Cl. A01j *5/04*
U.S. Cl. 119—14.49 **4 Claims**



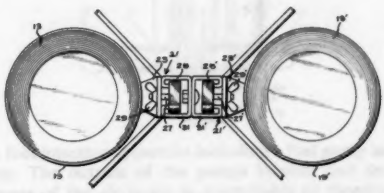
An improvement in milking inflations having a teat-receiving collar wherein the inner periphery of the collar is of generally uniform thickness and when projected onto a plane passed through the center of the inner periphery and perpendicularly to the major axis of the body portion of the inflation has a generally circular configuration with a perimeter of finite length. The inner periphery of the collar is formed of a series of contiguous wave forms representing periodic oscillations above and below the aforementioned plane, the true length of the inner periphery, along the wave forms, exceeding the finite length of the projected perimeter by a given distance, half of the true length falling above and half falling below said plane.

3,661,121

DOG FEEDING APPARATUS

Ronald P. Zielin, 3760 North Harding, Chicago, Ill.

Filed Feb. 9, 1970, Ser. No. 9,577
Int. Cl. A01k *05/00*
U.S. Cl. 119—61 **2 Claims**

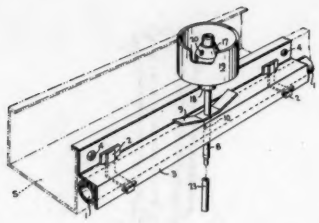


Dog feeding apparatus in which feed dishes are supported on a standard for selective positioning of the feed dishes at appropriate heights for the size and breed of dog.

3,661,122
WATERING SYSTEM FOR FOWL

Charles H. Willauer, Jr., 105 California Road, Quakertown, Pa.

Original application Jan. 10, 1958, Ser. No. 696,893, now Patent No. 3,559,621, dated Feb. 2, 1971. Divided and this application Apr. 13, 1970, Ser. No. 27,829
Int. Cl. A01k *07/00*
U.S. Cl. 119—72 3 Claims

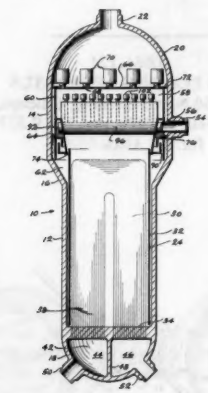


The invention disclosed is an improved low-cost system for watering fowl which maintains without overflow a supply of water at one or more drinking stations, with means for stopping the supply of water at each station individually. A new and simplified supply valve at each station which eliminates the usual causes of valve failure is also a feature of the system disclosed. By utilizing feed troughs as the framework for the system, the invention requires no duplicating supporting structure.

3,661,123
STEAM GENERATOR FEEDWATER PREHEATER

Nicholas D. Romanos, Chattanooga, Tenn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Dec. 31, 1970, Ser. No. 103,188
Int. Cl. F22b *1/16*
U.S. Cl. 122—34 14 Claims

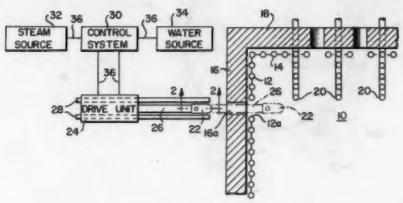


Feedwater preheating apparatus for a shell and tube type vapor generator is disclosed incorporating a plurality of nozzles arranged to discharge cold feedwater into a collector conduit disposed in a region of the unit containing heated fluid. Inductor means are provided to aspirate heated fluid into the collector conduit for mixing with the feedwater whereby the latter is heated.

3,661,124
APPARATUS AND PROCESS FOR SLAG DEPOSIT REMOVAL

Justin P. Winkin, Fairlawn, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed June 19, 1970, Ser. No. 47,694
Int. Cl. F28g *3/00*
U.S. Cl. 122—392 4 Claims

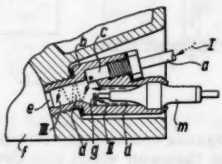


An apparatus for removing slag from the heat absorption surface in the furnace section and convection section of a heat exchanger including at least one blast nozzle disposed proximate to the surface and having at least two outlet orifices. A first fluid, such as water, is delivered to one of the orifices, and a second fluid, such as steam, is delivered to the other orifice to create a thermal shock and mechanical force which causes the slag deposits to separate from the heat absorption surface.

3,661,125
METHOD AND APPARATUS FOR ADAPTING ENGINE TO STRATIFIED CHARGE OEPRATION

Friedrich Stumpfig, Bismarckstr. 31, Nurnberg, Germany

Filed Jan. 29, 1968, Ser. No. 701,290
Claims priority, application Germany, Jan. 27, 1967, St 26424
Int. Cl. F02b *17/00*
U.S. Cl. 123—32 ST 8 Claims



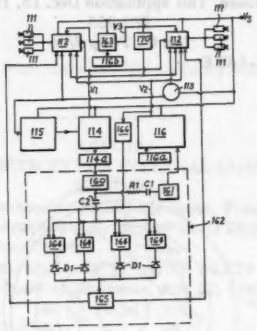
Method and apparatus for operating a two-cycle or four-cycle externally excited combustion engine with external ignition means where at least the fuel required for the ignition is introduced without admixture of main air into an evaporating chamber open toward the combustion chamber where it is precipitated against a non-water cooled wall that is hot during operation and which is elongated and encompasses the vaporizing chamber, is vaporized and is pushed to the ignition point in the vaporizing chamber together with some air until ignition takes place and where immediately after the ignition burning mixture is blown out of the vaporizing chamber into the combustion chamber, where the introduction of the fuel into the vaporizing chamber begins preferably at the end or shortly after the power stroke, after which during the compression stroke compressed air or compressed air-fuel mixture is pushed out of the combustion chamber into the vaporizing chamber, is mixed therein with vaporized fuel and the mixture is pushed to the ignition point provided in the vaporizing chamber, while simultaneously the burned out fuel gas in the vaporizing chamber is moved into a closed end of the vaporizing chamber and is compressed there, whereupon after the ignition burning mixture is blown away

from the ignition point in the form of a bunched, very rapid stream of flames through the vaporizing chamber and, subsequently, the last parts of the burning mixture are displaced in the vaporizing chamber toward the combustion chamber by the burned out fuel gas.

3,661,126
FUEL INJECTION SYSTEMS

Albert E. Baxendale, Coventry, England, assignor to Brico Engineering Limited, Coventry, England

Filed Sept. 10, 1969, Ser. No. 856,758
Claims priority, application Great Britain, Sept. 12, 1968, 43/503/68
Int. Cl. F02b *3/10, 33/00*
U.S. Cl. 123—32 EA **1 Claim**

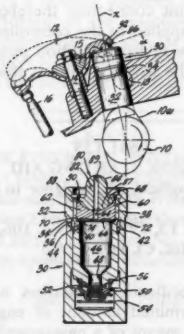


The invention relates to a fuel injection system wherein enrichment of the fuel is effected, when the engine is conditioned for acceleration, by means applying to the electromagnetic fuel injection valves, further energizing pulses in addition to those which are applied to the injectors during normal operation of the engine.

3,661,127
HYDRAULIC TAPPET WITH SWIVELABLY MOUNTED PUSHROD

Richard D. Cornell, Muskegon, Mich., assignor to Johnson Products, Inc., Muskegon, Mich.

Filed May 7, 1970, Ser. No. 35,527
Int. Cl. F01l *1/14;* **F01m** *9/10*
U.S. Cl. 123—90.27 **4 Claims**

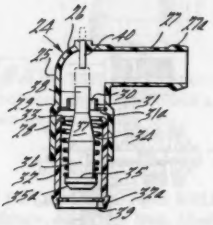


A hydraulic tappet in an overhead cam engine characterized by a rocker arm seat swivelably mounted in the tappet and with respect to the rocker arm so as to compensate for the axial misalignment of the rocker arm during the reciprocation of the tappet.

3,661,128
CRANKCASE VENTILATION

Robert W. Eshelman, Ann Arbor, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 25, 1970, Ser. No. 40,013
Int. Cl. F02m *25/06;* **F02f** *9/00*
U.S. Cl. 123—119 B **7 Claims**

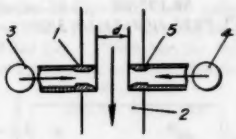


The crankcase for an internal combustion engine is vented to the fuel-air inlet induction passage via a ventilation valve comprising a tubular valve housing having a comparatively small metering orifice which cooperates with a movable valve element responsive to decreasing pressure in the induction conduit for restricting the orifice. A coil spring yieldingly opposes closing movement of the valve element and is seated on a tubular spring retainer adjustably telescoped into the upstream end of the valve housing to effect a predetermined rate of gas flow through the orifice when a predetermined low pressure differential corresponding to part load operation of the engine is applied across the orifice. Downstream of the orifice, a cylindrical movement limiting plunger extends through an opening in the sidewall of an elbow in the housing and is secured at a position adjusted to engage and limit closing movement of the valve element to effect a predetermined low rate of gas flow through the orifice when a predetermined high pressure differential is applied across the orifice corresponding to engine idling.

3,661,129
FUEL INJECTION APPARATUS

Junzo Uozumi, and Junki Iwata, both of Aichi Prefecture, Japan, assignors to Aisan Kogyo Co., Ltd., Chita-gun, Aichi Pref., Japan

Filed July 16, 1969, Ser. No. 842,310
Int. Cl. F02m *61/02*
U.S. Cl. 123—119 **2 Claims**



A fuel injection apparatus including a fuel pump and an air pump. The outputs of the pumps interact and the output pressure of the air pump is controllable to thereby control the output of the fuel pump. In one embodiment, the air and fuel are injected separately into an intake cylinder of a spark-ignition combustion engine through opposing inlets, the inlets being aligned so that the injected air is directed toward the fuel inlet to control the amount of fuel entering the cylinder. In a second embodiment, the outputs from the pumps con-

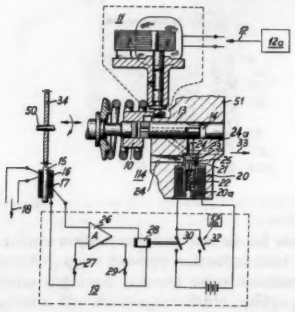
nect with a common fluid duct through which the mixed fuel and air are injected into the intake.

3,661,130

SAFETY DEVICE FOR LIMITING THE ROTATIONAL SPEED OF INTERNAL COMBUSTION ENGINES

Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 17, 1970, Ser. No. 20,276
Claims priority, application Germany, Mar. 19, 1969, P 19 13 808.0
Int. Cl. F02d *5/00*
U.S. Cl. 123—140 A **9 Claims**



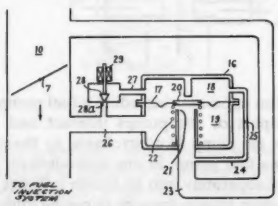
An electronically controlled diesel engine wherein the high-pressure chamber of the fuel injection pump is connected with the low-pressure chamber by a passage controlled by an electromagnetic valve which opens or closes when the rotational speed of the engine reaches a maximum permissible value. The speed is detected by an electrical counter which effects opening of the valve if the latter is installed in a passage which conveys fuel from the high-pressure chamber, or closing of such valve if the latter is installed in a passage which supplies fuel to the high-pressure chamber, whenever the engine speed reaches the maximum permissible value. The electrical connection between the speed counter and the valve comprises an amplifier whose input circuit contains an inductance of the speed counter and a first safety fuse and whose output circuit contains a relay switch for the circuit of the winding in the valve and a second safety fuse. The circuit of the winding can be completed by an auxiliary switch in response to actuation of the starter for the engine.

3,661,131

SPEED CONTROLS

Brian Hugh Croft, Coventry, England, assignor to Brico Engineering Limited, Coventry, England

Filed Nov. 28, 1969, Ser. No. 880,563
Claims priority, application Great Britain, Dec. 6, 1968, 58,195/68
Int. Cl. F02d *1/04, 11/10, 3/00*
U.S. Cl. 123—140 J **11 Claims**



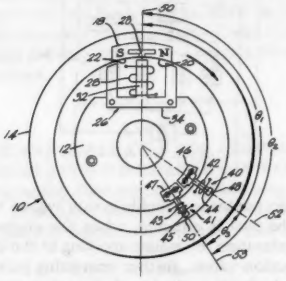
The invention relates to speed control systems for controlling the rotational speed of an internal combustion engine and provides means for controlling the engine utilizing a fuel injection system idling speed so as to maintain it at a substantially constant pre-selected value which is virtually independent of ambient conditions and engine load conditions. Different types of valve means are described for controlling the flow of air from a point at substantially atmospheric pressure to a point downstream of the engine throttle valve. Control circuits are also described for controlling the valve means in accordance with the difference between a pre-selected value of engine idling speed and the actual engine idling speed.

3,661,132

IGNITION CIRCUIT WITH AUTOMATIC SPARK ADVANCE

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of application Ser. No. 684,052, Nov. 17, 1967, now abandoned. This application Dec. 15, 1969, Ser. No. 882,355
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **15 Claims**



A solid state capacitor discharge ignition system for use in a single-cylinder engine having a magneto for an electrical energy source wherein the capacitor is discharged through a silicon controlled rectifier in response to trigger signals generated by a trigger assembly mounted on the rotor and stator of the magneto. The trigger assembly generates at least two discrete spaced pulses at running and cranking speeds, and the spacing between the two pulses corresponds to a desired shift in the engine timing between cranking and running speeds. The trigger assembly, the silicon controlled rectifier and the circuit connection therebetween are such that both pulses are applied to the controlled rectifier at all engine speeds; but the retarded ignition pulse is effective at cranking speeds and the advance pulse is effective at running speeds.

3,661,133

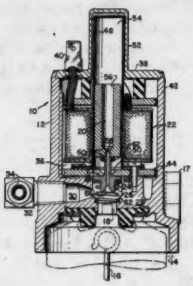
ENGINE STARTING AID

Leroy L. Rasch, Springfield, Ill., assignor to Stewart-Warner Corp., Chicago, Ill.

Filed Jan. 13, 1971, Ser. No. 106,148
Int. Cl. F02m *1/16*
U.S. Cl. 123—180 R **8 Claims**

The following specification describes an assembly for delivering a predetermined amount of engine starting aid fluid to an engine by means of a passageway through a solenoid armature placed in communication with the valve of a starting aid can on energization of the solenoid coil to communicate the starting aid to a chamber of known volume. On

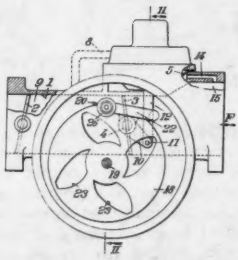
deenergization the armature drives the fluid in the chamber through the passageway to the engine and the fluid is maintained separate from the electrical circuitry without the use of moving seals.



3,661,134
FUEL FEED DEVICES FOR INTERNAL COMBUSTION ENGINES

Andre Louis Mennesson, Neuilly-sur-Seine, France, assignor to Societe Industrielle De Brevets Et D'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed July 21, 1970, Ser. No. 56,879
Claims priority, application France, July 22, 1969, 6925000
Int. Cl. F02m *51/00*
U.S. Cl. 123—139 AW **8 Claims**



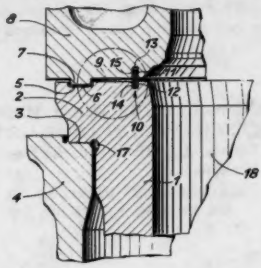
The fuel feed device includes a valve actuated by an electromagnet, which is energized over a variable fraction of each revolution of a rotating member driven by the engine. To modify the moment of the injection, means sensitive to the load on the engine alter the angular position of the rotary member with respect to the engine drive take-up means. The modifying means can be a differential gear device.

3,661,135
WET CYLINDER LINER FOR PISTON-TYPE INTERNAL COMBUSTION ENGINES

Kurt Weiss, Chatswood, New South Wales, Australia, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 9, 1968, Ser. No. 743,571
Claims priority, application Switzerland, July 12, 1967, 9958/67
Int. Cl. F16j *15/08*
U.S. Cl. 123—193 **6 Claims**

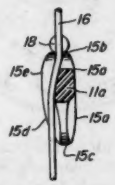
There is disclosed for piston-type internal combustion engines a replaceable wet liner construction in which an annular packing fits into coaxial open grooves, one in a flange at the top of the liner and the other in the cylinder head, facing each other across a gap between the head and liner which extends from the inside wall of the liner radially out across the top of the flange of the liner to a location at which the flange is compressed between the engine block and head. Particular shapes are shown for the packing ring.



3,661,136
BOW CORD RETRACTING AND RELEASING DEVICE

Melvin H. Bradshaw, 62 N. 4th East, Moab, Utah

Filed Aug. 26, 1970, Ser. No. 67,022
Int. Cl. F41c *19/00*
U.S. Cl. 124—35 **6 Claims**

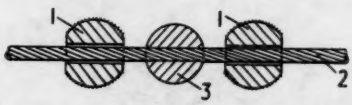


A unitary rigid body shaped to provide a hand grip portion and a bowstring-engaging trigger member disposed forwardly of the grip portion and interconnected therewith by a stem portion. The hand grip portion is held in an upright position when the body is being used to retract a bow string. The trigger member is elongate longitudinally of the bow string when engaged and is rearwardly channeled longitudinally thereof but canted outwardly of the stem from one end of such trigger portion toward the opposite end thereof the trigger member terminates in a smooth and tapering mergence with the adjacent lateral face of the trigger member, preferably intermediate the length thereof, to provide an outwardly canted hook formation capable of securely holding the bow string until the rigid body is tipped forwardly to effect easy and smooth release of such bow string.

3,661,137
SAW ELEMENTS

Derek Henry George Prowse, and Stephen Derek Prowse, both of Marina-Di-Carrara, Italy, assignors to Industrial Distributors (Sales) Limited, London, England

Filed Oct. 7, 1969, Ser. No. 864,506
Claims priority, application Great Britain, Oct. 18, 1968, 49,578/68
Int. Cl. B28d *1/08*
U.S. Cl. 125—21 **10 Claims**



A saw element in which an elongate carrying member for example a wire has threaded thereon a plurality of hard

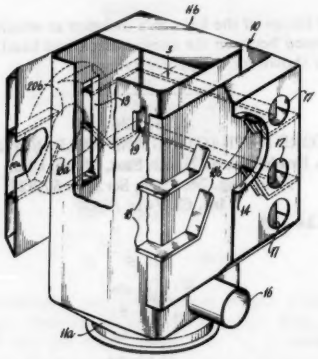
beads free to rotate on the wire and having outer abrasive surfaces which are convex in the direction of the carrying member, with these abrasive elements which preferably include diamond particles as an abrasive medium being interspersed with non-abrasive spacer elements which grip the wire.

3,661,138

EXTERIOR WALL STRUCTURAL MEMBER FOR A HEAT EXCHANGER IN A HOT-AIR HEATER

Vernon M. Barnes, Jr., Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed June 29, 1970, Ser. No. 50,575
Int. Cl. F24c *3/00;* **F24h** *3/06*
U.S. Cl. 126—91 R **4 Claims**



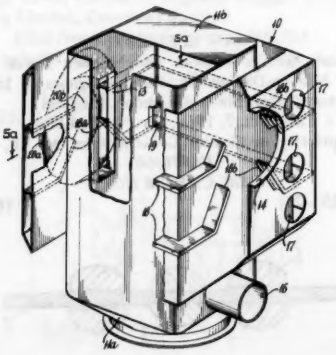
An outside wall panel for a heat exchanger in an air heater furnace wherein the cross-over port structure from the first stage of a heat exchanger is an elongated rectangular inlet into the second stage of the heat exchanger, which has a number of spaced flanges therein for guiding the flow of the products of combustion more evenly in their passage to the outlet of the second stage, the panel having a pair of concave-convex deformations joined together by gradual curves to define a dimple.

3,661,139

EXTERIOR WALL STRUCTURAL MEMBER FOR A HEAT EXCHANGER IN A HOT-AIR HEATER

Newton P. Randall, and Brian J. Lewis, both of Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 29, 1970, Ser. No. 50,576
Int. Cl. F24c *3/00;* **F24h** *3/06*
U.S. Cl. 126—91 R **5 Claims**



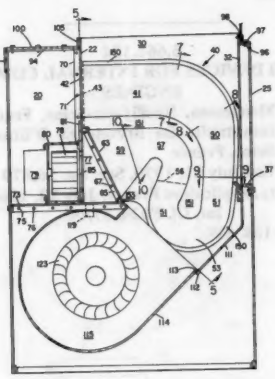
An outside wall panel for a heat exchanger in an air heater furnace wherein the cross-over port structure from the first stage of a heat exchanger is an elongated rectangular inlet into the second stage of the heat exchanger, which has a number of spaced flanges therein for guiding the flow of the products of combustion more evenly in their passage to the outlet of the second stage, the panel having one or more deformations or corrugations based on an isotherm pattern and raised from a flat surface or may be in the form of a pair of concave-convex deformations joined together by gradual curves to define a dimple, this pair also being based on an isotherm pattern.

3,661,140

GAS-FIRED FURNACE

William F. Raleigh, Hacienda Heights, Calif., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 17, 1970, Ser. No. 47,041
Int. Cl. F24h *3/06*
U.S. Cl. 126—110 R **7 Claims**



Each heat exchanger cell mounted in the heat tunnel has an elongated flue gas passage of serpentine form. One end of the passage is formed with a burner inlet combustion chamber with means to receive a burner, and the opposite end of the passage communicates with a flue gas discharge opening connected to an induced draft system. The intermediate portion of the flue gas passage extends through a return bend section which is located at the inlet end of the heat tunnel. The sides of the heat cell diverge in a direction from the return bend portion toward the inlet combustion chamber. A blower creates an air flow against the return bend portion and through the tunnel in contact with the sides of the cells. The heat exchanger cells and the sides of the heat tunnel are arranged to provide a vaned-diffuser effect in the heat tunnel.

3,661,141

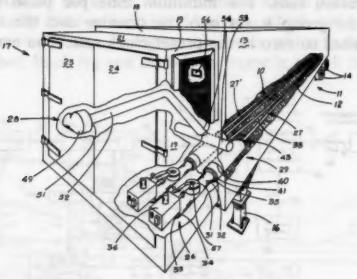
HEATING SYSTEM FOR STORAGE TANK

Willard L. Salemink, 209 W. Sixth Street, West Liberty, Iowa

Filed July 10, 1970, Ser. No. 53,756
Int. Cl. E01c *19/45*
U.S. Cl. 126—343.5 A **3 Claims**

A system for heating asphaltic cement in a storage tank. The system including a burner, a pipe fluidly connected to the burner and submerged in the cement, a dissipator enclosing the pipe adjacent to the burner to prevent "coking" of the cement disposed adjacent thereto, and a vacuum pump fluidly connected to the pipe for circulating heated gases through the pipe. The dissipator is fluidly connected to the pipe and to the atmosphere such that the vacuum pump also

draws atmospheric air into the dissipator to cool the pipe adjacent the burner, which air is heated thereby and drawn



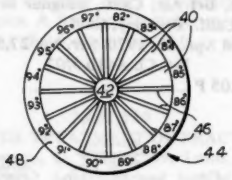
through the system to aid in heating the cement. Controls may be provided to automatically activate the burner and pump.

3,661,142

TEMPERATURE-SENSING PATCH

Eric Flam, East Brunswick, N.J., assignor to Johnson & Johnson

Filed Feb. 5, 1970, Ser. No. 8,902
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 H 16 Claims



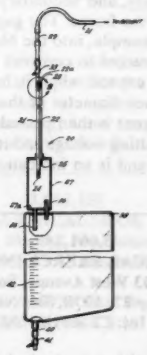
This temperature-sensing patch comprises a flexible backing web having a pressure-sensitive adhesive coated on one side and a plurality of discrete temperature-sensitive, color-responsive indicators adhered on the other side thereof. Each of the indicators comprises a layer of encapsulated liquid crystals which change in color responsive to temperature changes within a predetermined temperature range.

3,661,143

MEDICAL APPARATUS FOR DRAINAGE, COLLECTION AND MONITORING OF BODY FLUIDS

Melvyn L. Henkin, 19640 Greenbriar Drive, Tarzana, Calif.

Filed June 23, 1969, Ser. No. 835,619
Int. Cl. A61b *5/10*
U.S. Cl. 128—2 59 Claims



A sealed fluid drainage system, particularly well adapted for urine drainage, collection and monitoring, including parallel drainage tubes in fluid communication via a venting passage, the tubes and associated drip chambers being physically arranged to provide a difference in hydrostatic pressure for initiating liquid flow and completely draining liquid from the tubes and chambers. Highly reliable valving and flexible drip chamber configurations enable further enhancement of unidirectional flow and system line clearing capabilities. An effective gas gap is also provided to minimize the possibility of ascending infections in the system. Fluid collection is accomplished in a sealed, multi-chamber, flexible, calibrated container, with fluid being first directed into the smallest chamber and overflowing successively or being deliberately emptied into larger capacity chambers. Suitably located drain tubes permit selective sampling of liquid from the smallest chamber or complete emptying of the container from the largest chamber.

3,661,144

SUCTION APPARATUS FOR BODY CAVITIES

Jorgen Albrecht Jensen, Sonderborg, and Jorgen Gars Jensen, Farum, both of Denmark, assignors to Hans Gram, Klampenborg, Denmark

Filed Sept. 16, 1969, Ser. No. 858,305
Claims priority, application Denmark, Sept. 17, 1968, 4454/68
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 B 5 Claims

An apparatus for removal, by scraping or cutting, of a sample of the internal wall of body cavities and collecting the sample in a container. It consists of a cylindrical container, adapted to be held in one hand and carrying a cannula, the end of which is closed, with a sharp-edged slot being provided closely behind the end. The cannula, during use, is rigidly connected with the container so that it can be manoeuvered therewith using the container as a handle device. The container has a sieve to longitudinally divide the container and to retain the sample, while permitting passage of liquids therethrough, and is connectable with a vacuum tube.

3,661,145

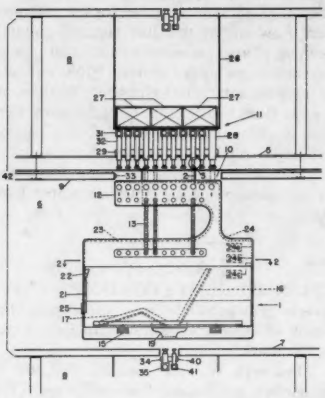
ENVIRONMENTAL CONTROL CAPSULE AND SYSTEM THEREFOR

William N. Breger, 193 West 10th Street, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,791
Int. Cl. A61b *19/00*
U.S. Cl. 128—2 7 Claims

A capsule for the storage and movement of patients in hospitals providing all necessary life support systems in a controlled environment for the patient, as well as all necessa-

ry monitoring of the patient's need as a part of the system, together with a plurality of other similar capsules movably mounted on track means so that the patient, while in the capsule, can be moved to various areas within a hospital such as



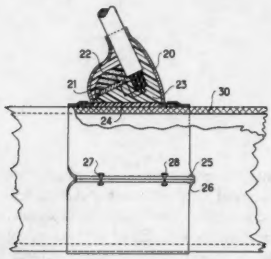
the nursing area, the operating room, the radiology room and so forth, on either the same or separate levels, together with control means for operating the capsule and its movement within the various areas.

3,661,146

TRANSDUCER ARRANGEMENT FOR MEASURING BLOOD FLOW

Pierre Peronneau, Paris, and Fernand Leger, Gif-sur-Yvette, both of France, assignors to Compagnie Generale D'Electricite, Paris and Agence Nationale de Valorisation de la Recherche (Anvar), Recherche (Anvar), France

Filed Dec. 31, 1969, Ser. No. 889,401
Claims priority, application France, Dec. 31, 1968, 183135
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 F **1 Claim**



Perivascular transducer whose piezoelectric plate is bordered on one side thereof by a reflecting and/or absorbing mass and which is equipped with two plastic bands adapted to form a collar around the vessel which is intended to be subjected to the measurement.

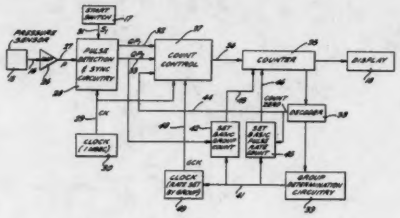
3,661,147

PULSE RATE COUNTER AND DISPLAY AND METHOD OF OPERATION

William L. Mason, 1630 West Oak Avenue, Fullerton, Calif., and Donald J. Lantz, 1520 Dana Place, Fullerton, Calif.

Filed Nov. 10, 1969, Ser. No. 875,285
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 T **17 Claims**

A pulse rate counter and display applicable for indicating pulse rate of the human body. A counter is advanced at a preset clock rate to measure the time duration between two consecutive pulse beats. Appropriate circuitry determines within which of a group of pulse rate ranges this measured time duration falls. The minimum time per pulse for the determined group is set into the counter and the counter decremented to zero at the preset clock rate. The maximum



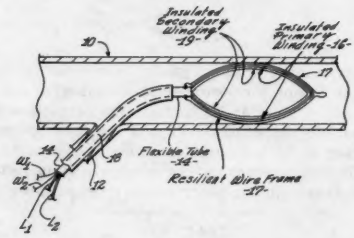
pulse rate of the group then is preset into the counter and the counter decremented at a selected rate corresponding to the approximate slope of the curve of pulse rate versus time per pulse for the determined group. Decrementing terminates upon occurrence of the third consecutive pulse beat, the contents of the counter then indicating the measured pulse rate.

3,661,148

INDUCTION TYPE ARTERY GAGE

Alexander Kolin, Bel Air, Calif., assignor to Regents of the University of Calif., Berkeley, Calif.

Filed Apr. 13, 1970, Ser. No. 27,516
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 P **5 Claims**



An improved induction type gage is provided which is intended to be used to measure the diameter of a blood vessel within a living subject, and to provide a means for detecting and measuring slight pulsating variations in the diameter of the blood vessel. The gage includes, for example, a collapsible frame and primary and secondary electric inductance windings attached to the frame. The gage may be introduced percutaneously, for example, into the blood vessel to be measured, and it is constructed to constrict as it is so introduced and subsequently to expand when it has entered the blood vessel to span the inner diameter of the blood vessel. An alternating electric current is then passed through the primary winding and the resulting voltage induced in the secondary winding is measured and is an indication of the diameter of the blood vessel.

3,661,149

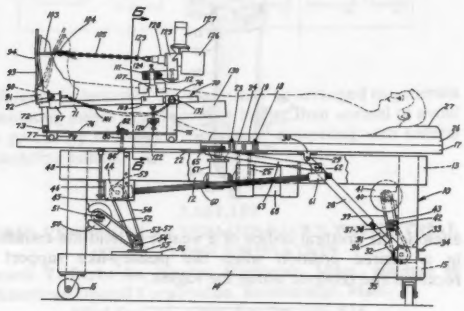
MECHANICAL EXERCISING DEVICE

Charles A. Ferries, 403 West Avenue, South, La Crosse, Wis.

Filed May 27, 1970, Ser. No. 40,864
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 R **15 Claims**

A mechanical exercising or physical therapy device for the controlled progressive stretching and exercise of the legs of

persons afflicted by diseases characterized by contracture of tendons and muscles of the legs and back. The device includes a table on which the patient may lie. It is provided with a pivoted back rest which can be raised and lowered mechanically and two individual leg rests which can be raised and lowered and also swung to either side, either individually or together. Each leg rest includes a frame in which the leg is



supported. At its extremity, there is a mechanism for shackling the foot. An adjustable bridge member over the knee permits application of pressure to the knee in controlled increments to force the knee down to straighten the leg and stretch the muscles. A further adjustable mechanism is provided for pivoting the foot on its ankle to stretch the heel cords.

3,661,150

SPLINT FOR THE TREATMENT OF FRACTURED LEGS

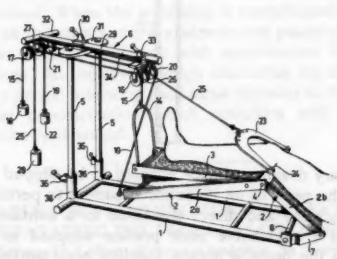
Curt Y. G. Peterssen, O. Vallgat. 49, Lund, and Goran A. Widolf, KSA 43012, Apelviksstrand, both of Sweden

Filed Nov. 24, 1969, Ser. No. 879,024

Claims priority, application Sweden, Nov. 26, 1968, 16065/68

Int. Cl. A61f *5/04*

U.S. Cl. 128—85 **6 Claims**



A synergical splint for the treatment of fractured legs is provided with a frame, a support for the femur pivotally connected to the frame and a support for the tibia-fibula pivotally connected to said femur support, said supports being pivotable independently of each other.

3,661,151

SURGICAL SHOE

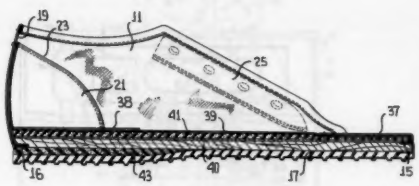
Errol A. Schoenbrun; Murray M. Lichtenstein, and Bernard Podos, all of El Paso, Tex., assignors to PSL Industries, Inc., El Paso, Tex.

Filed Feb. 6, 1970, Ser. No. 9,199

Int. Cl. A61f *5/04*

U.S. Cl. 128—87 R **7 Claims**

A shoe converted to aid post-operative rehabilitation of the foot and to serve as a splint or cast for foot fractures is provided with rigid plywood midsole to restrict undesirable foot movement during ambulation. The shoe upper is modified by eliminating the conventional toe box and tongue so that the shoe can be readily adjusted to compensate for swelling of the foot constriction loosening lacing placed through eyelets in the upper. Elimination of the toe box and



tongue a also decreases post-operative constriction of the foot within the shoe contributing to undesirable swelling. In all other respects the shoe remains unmodified, to allow both feet to be the same height for the walking surface when a normal shoe is worn on the other foot, for cosmetic purposes, and to permit ambulation with maximum comfort and convenience.

3,661,152

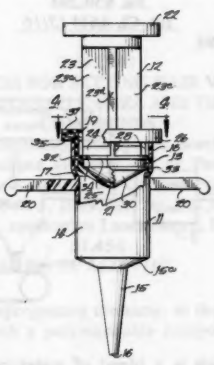
SYRINGE WITH SELF-RETURNABLE PLUNGER

Frank R. Beich, Willmette, and Glenn L. Beall, Gurnee, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 8, 1970, Ser. No. 35,846

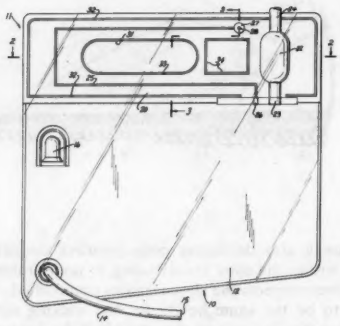
Int. Cl. A61m *1/00*

U.S. Cl. 128—235 **12 Claims**



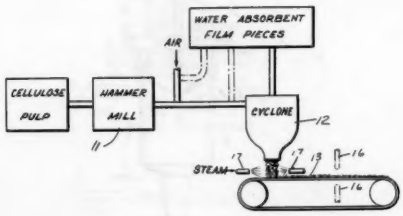
A plunger-type syringe is provided in which the plunger returns after it is depressed. The syringe includes an elastic membrane which is received by the tubular barrel and interposed between the barrel and the plunger. A portion of the membrane is secured to the end of the barrel and is thereby restrained against longitudinal movement, and another portion is engagable with the plunger for longitudinal movement therewith within the barrel. As the plunger is depressed, the membrane is stretched and provides a force tending to return the plunger to its original position. When the plunger is released, the elastic membrane returns the plunger.

3,661,153
BODY FLUID DRAINAGE BAG
Edgwin R. Polk, Fords, N.J.; Sidney Polansky, Great Neck, N.Y., and Louis Mirando, Upper Saddle River, N.J., assignors to Packaging Associates Inc.
Filed Mar. 27, 1970, Ser. No. 23,146
Int. Cl. A61f 5/44
U.S. Cl. 128—275 7 Claims



A drainage bag including a limp fluid receptacle portion and a stiffer header secured to the upper edge of the receptacle portion. The header is integrally formed with a drip chamber, and may also be formed with an air vent, a carrying and suspension hole, and stiffener ridges.

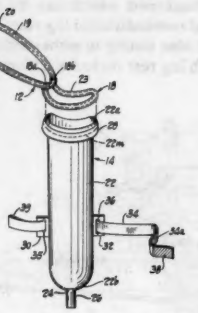
3,661,154
WATER-ABSORBING MATERIAL
David Torr, P. O. Box 1, Oyster Bay, N.Y.
Continuation-in-part of application Ser. No. 784,699, Dec. 18, 1968, now abandoned. This application May 26, 1969, Ser. No. 830,205
Int. Cl. A61f 13/16
U.S. Cl. 128—284 6 Claims



A sheet which is a blend of water-insoluble fibers and pieces of film of a dry material which converts to a gel quickly on contact with a large amount of water. The blend is formed by suspending the fibers and film pieces in air. The sheet is useful in structures designed for absorbing body fluids, e.g. disposable diapers.

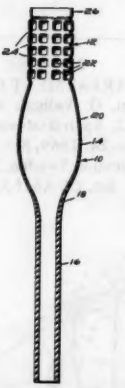
3,661,155
FEMALE URINARY INCONTINENCE DEVICE
Rosemary Lindan, 1404 Dorsh Road, Cleveland, Ohio
Filed Feb. 24, 1970, Ser. No. 13,684
Int. Cl. A61f 5/44
U.S. Cl. 128—295 11 Claims

A female urinary incontinence device including a pessary-like support, a deformable loop extending outward from the support and a flexible container removably secured to and opening through the loop. The deformable loop is adapted to



encircle the urethral orifice of a wearer to hold the container in a desired position when the pessary-like support is received and retained within the vagina.

3,661,156
URINARY DRAINAGE DEVICE
Gladys M. McLaughlin, 8 Westerly Street, Jamaica Plain, Mass.
Filed Feb. 5, 1969, Ser. No. 796,831
Int. Cl. A61f 5/44
U.S. Cl. 128—295 7 Claims

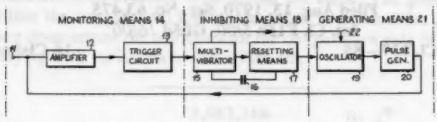


A urinary drainage device adapted to be slipped over and held on the penis of an incontinent patient to permit the patient to urinate and direct the urine to a container which comprises a stretchable neck portion adapted to hold the device on the penis, a hollow bulblike body portion for the penis and a narrow end portion adapted to be connected to a drainage tube.

3,661,157
INHIBITED DEMAND PACER WITH A TWO-RATE PULSE GENERATOR
John William Fyson, Newbury; John Raymond Truscott, Reading, and George Edgar Sowton, London, all of England, assignors to National Research Development Corporation, London, England
Filed Apr. 16, 1970, Ser. No. 29,016
Claims priority, application Great Britain, Apr. 16, 1969, 19,547/67
Int. Cl. A61n 1/36
U.S. Cl. 128—419 P 16 Claims

In a pacer for artificial heart stimulation, the stimulating pulses produced are inhibited when the pacer detects that

natural heartbeats are present. If the pacer detects electrical pulses at a frequency higher than a predetermined threshold frequency, resulting from external interference, the inhibition is suspended, and stimulating pulses are supplied. When interference is detected, the pacer may be arranged to generate stimulating pulses at a frequency higher than normal to avoid the possibility of the artificial pulses competing with natural stimulating pulses.

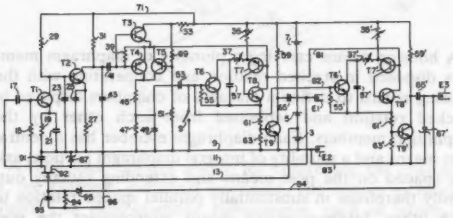


3,661,158

ATRIO-VENTRICULAR DEMAND PACER WITH ATRIAL STIMULI DISCRIMINATION

Barouh V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 15, 1969, Ser. No. 884,825
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **24 Claims**



An atrial and ventricular demand pacer. The demand pacer of the present invention provides atrial stimulation and also protects against ventricular asystole. In patients with atrial bradycardia but normal AV conduction, only the atria are stimulated. When the condition is complicated with AV block, both the atria and the ventricles are pacer controlled. The pacer does not compete with spontaneous ventricular contractions. An improved design eliminates the need for a refractory period following each atrial stimulus so that even a ventricular depolarization which coincides with an atrial stimulus can be detected.

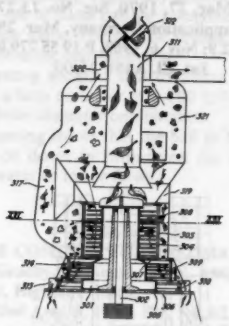
3,661,159

APPARATUS FOR STEMMING TOBACCO LEAVES AND SEPARATING THE PRODUCTS OBTAINED

Andre Pietrucci, Loiret, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Original application Nov. 2, 1966, Ser. No. 591,606, now Patent No. 3,513,858, dated May 26, 1970. Divided and this application Apr. 21, 1970, Ser. No. 30,427
Claims priority, application France, Nov. 3, 1965, 37153; Nov. 17, 1965, 38785; Aug. 26, 1966, 74210; Sept. 20, 1966, 76911
Int. Cl. A24b *05/10*
U.S. Cl. 131—146 **6 Claims**

Apparatus for stemming tobacco leaves and for segregating the lighter and heavier parts of the resulting mixture comprises a stemming chamber for a rotary stemming unit serving to stem tobacco leaves which are admitted by way of a first inlet of the stemming chamber. The latter has at least one second inlet for admission of a current of separating air, at least one outlet for evacuation of heavier parts, and at least one outlet for evacuation of lighter parts with the air current. The distribution of outlets is such that the direction in which the lighter parts are evacuated with the air current



is at least substantially counter to the direction of evacuation of heavier parts. This can be achieved by using the inlet or inlets for air as outlet or outlets for heavier parts.

3,661,160

TOBACCO SMOKE FILTER

Deger Tunc, Edison, N.J., assignor to Johnson & Johnson

Filed Jan. 28, 1970, Ser. No. 6,644
Int. Cl. A24b *15/02;* **A24d** *01/06*
U.S. Cl. 131—266 **2 Claims**

A filter for tobacco smoke which is capable of removing nicotine and other constituents from the smoke is disclosed. The filter element is composed at least in part of cellulose sulfate compound of the formula R-cellulose-OSO_3X wherein R is one or more functional groups selected from the group consisting of methyl, ethyl, propyl, butyl, hydroxyethyl, hydroxylpropoxyl and hydroxylbutoxyl, and X is selected from the group consisting of hydrogen, sodium and potassium. The preferred compound is sodium ethylcellulose sulfate.

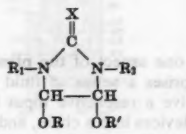
3,661,161

PROCESS FOR SETTING HAIR WITH POLYCONDENSABLE UREA AND THIOUREA COMPOUNDS

Gregoire Kalopissis; Henry Philippe De Beaulieu; Jean-Louis Abegg, and Giuliana Ghilardi, all of Paris, France, assignors to Societe Anonyme dite L'Oreal, Paris, France

Filed Dec. 3, 1969, Ser. No. 881,903
Claims priority, application Luxembourg, Dec. 4, 1968, 51.454
Int. Cl. A61k *7/10*
U.S. Cl. 132—7 **4 Claims**

Hair is set by impregnating the same, in the presence of an acidic catalyst, with a polymerizable compound having the formula



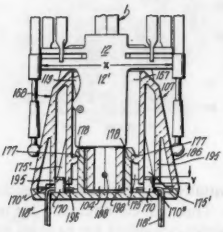
wherein X is oxygen or sulfur and R, R′, R_1 and R_2 each are hydrogen or lower alkyl, winding the hair on rollers and drying the hair.

3,661,162

UMBRELLA HANDLE

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed Mar. 27, 1970, Ser. No. 23,278
Claims priority, application Germany, Mar. 29, 1969, P 19 16 342.9; Nov. 6, 1969, P 19 55 779.0
Int. Cl. A45b *25/00*
U.S. Cl. 135—20 10 Claims



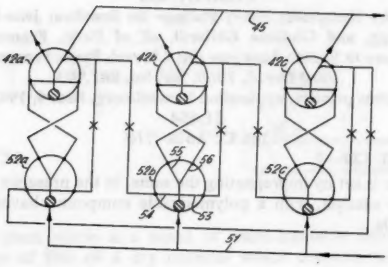
An umbrella handle comprising a hollow handle body and a snap-lock cap adapted to engage the body and a handle strap anchored to the cap. Snap-lock means in the cap are adapted to anchor with the cap and the strap to the interior of the handle body.

3,661,163

FLUID DISTRIBUTORS

John Grant, Risley Warrington, and Martin John Fisher, Cranfield, Bedford, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 14, 1967, Ser. No. 690,464
Claims priority, application Great Britain, Dec. 29, 1966, 58,224/66
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 2 Claims



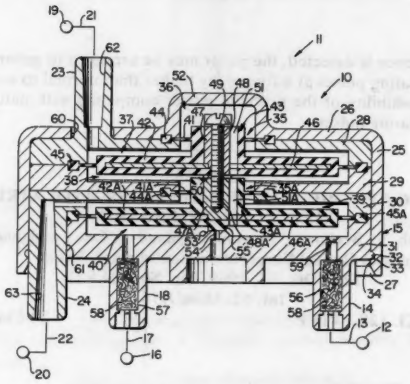
According to one aspect of the present invention a flow distributor comprises a series of fluid switch devices each adapted to receive a respective input flow, coupling paths connecting the devices into a chain, and two common output regions to one or other of which the input flows are routed through the device according to the conditions of the device, the coupling paths being arranged to divert from each device to the next in the chain, a diversionary flow which tends to propagate from the one device to the next the condition prevailing in the former.

3,661,164

PNEUMATICALLY OPERATED AVERAGING RELAY CONSTRUCTION AND SYSTEM UTILIZING THE SAME

Kenneth G. Kreuter, and Walter J. Berleyoung, both of Goshen, Ind., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 13, 1970, Ser. No. 63,475
Int. Cl. F15b *5/00*; G05d *16/00*
U.S. Cl. 137—85 16 Claims



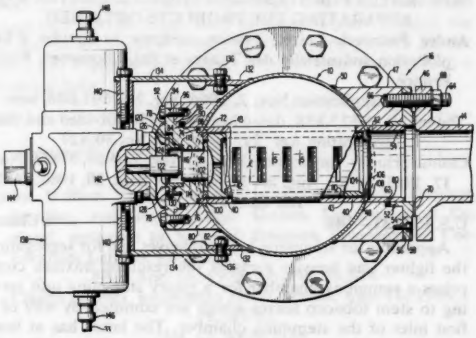
A housing means carrying a plurality of diaphragm members disposed in stacked relation and cooperating with the housing means to define a plurality of chambers disposed in stacked relation and separated from each other by the diaphragm members. Each diaphragm member has a central post means and a plurality of integral diaphragm portions axially spaced on the post means and extending radially outwardly therefrom in substantially parallel spaced relation to each other. Interconnecting means interconnect the post means of the diaphragm members together whereby the diaphragm members are adapted to move in unison in the housing means.

3,661,165

SYSTEM FOR MIXING GASES AND SPARGER VALVE FOR ACCOMPLISHING SAME

Herbert A. Rainbird, Ramsey, N.J., and William E. Gordon, Pittsburgh, Pa., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed July 21, 1970, Ser. No. 56,866
Int. Cl. G05d *16/14*
U.S. Cl. 137—100 15 Claims



In a vinyl acetate manufacture reactor feed line, oxygen is admixed with gaseous hydrocarbons in the process stream by

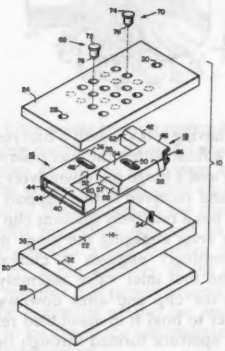
discharging the oxygen through jets facing downstream within the hydrocarbon gas flow, with the oxygen jet velocity maintained substantially higher than the velocity of the hydrocarbon gas. Variations in oxygen mass flow are made by varying the area of the jet orifices while maintaining a predetermined pressure drop across the same. The pressure within the oxygen feed line is controlled to control the pressure drop across the orifices with the oxygen flow rate in turn varying with variations in the orifice size.

3,661,166

FLUID LOGIC CONTROL SYSTEM

Ronald K. Dickason, Newark, N.Y., assignor to Garlock, Inc., Palmyra, N.Y.

Filed Jan. 12, 1970, Ser. No. 1,996
Int. Cl. F16k *11/20*
U.S. Cl. 137—269 **20 Claims**



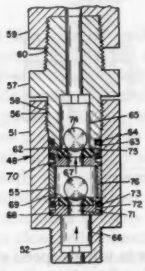
A fluid logic control system for controlling the operation of, for example, industrial machines. The system includes a plurality of fluid-operated components, each of which includes a casing having a chamber, a movable spool in the chamber, ports in the casing, and passageways in the spool. The components include: a fluid logic gate capable of performing any one of the four logic functions: AND, OR, NOT, NOR ; a multiple pole relay; a differential pressure relay; a micro-valve differential pressure relay; a pilot light; a selector switch; and a push button relay. The spools are self-sealing and the casings are interchangeable.

3,661,167

CHEMICAL FEED PUMP WITH IMPROVED VALVE MEANS

Norman R. Hussey, Amesbury, Mass., assignor to A & D Fabricating Company, Inc., Lowell, Mass.

Filed May 25, 1970, Ser. No. 40,082
Int. Cl. F16k *15/04*
U.S. Cl. 137—269.5 **1 Claim**



A diaphragm or piston type chemical feed pump has an influent valve and an effluent valve connected to the pumping chamber each having in some combination a single or multiple ball check valve system.

The valves of the pump are doubled and reversible within separable casings having oppositely disposed ball recesses so that the same set of parts can be assembled into an inlet or outlet ball check valve. For precise sealing, each valve has a resilient, self cleaning ball valve seat.

Extensive testing shows a ball diameter of five-sixteenths or 0.3125 and a hole diameter of 0.190 ± 0.006 to be the optimum ball to hole diameter combination.

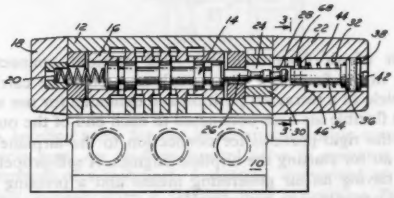
Additional testing shows that the ball to hole diameter can be scaled up or down in proportion for larger or smaller pumps with greater or lesser flows.

3,661,168

OVERRIDE CONTROL FOR PNEUMATIC VALVES

Donald E. McGeachy, Highland, Mich., assignor to Numatics, Incorporated, Highland, Mich.

Filed Aug. 6, 1970, Ser. No. 61,634
Int. Cl. F16k *11/07*
U.S. Cl. 137—270 **4 Claims**



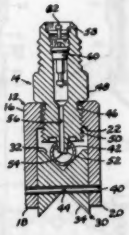
An override control for pneumatic valves which permits a valve to be manually actuated by manipulation of a plunger in an end cap of a valve housing, the invention being characterized by a selective positioning arrangement wherein the plunger can be either in a manual no-lock slot where it has strictly an in-and-out function or the plunger may be in a manual lock slot where it can have an out position and an in position at will. A further feature is that the plunger may not be shifted from one condition to another without removing the end cap, thus avoiding accidental change of condition.

3,661,169

LINE CLAMPING SELF-TAPPING SERVICE VALVE

John W. Mullins, P.O. Box 20524, Oklahoma City, Okla.

Filed Apr. 13, 1970, Ser. No. 27,559. The portion of the term of the patent subsequent to May 5, 1987, has been disclaimed.
Int. Cl. B23b *41/08*
U.S. Cl. 137—318 **2 Claims**



A U-shaped member straddles a line to be tapped. The legs of the U-shaped member project beyond the line and are transversely drilled for receiving a pin which journals a rectangular block between the legs. Opposing faces of the block are provided with a line receiving recess for use with a

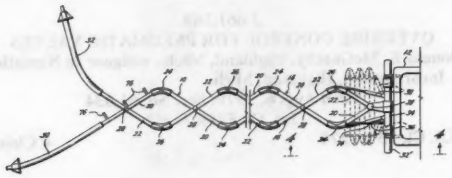
plurality of different sizes of lines. The bight portion of the U-shaped member is centrally drilled and threaded perpendicular to the axis of the straddle line for threadedly receiving a centrally bored air valve core equipped housing having a coaxial line piercing core projecting into the line.

3,661,170

AIR START SYSTEM FOR AIRPLANES

Robert W. Mitchell, Houston, Tex., assignor to Stewart & Stevenson Services, Inc., Houston, Tex.

Filed Dec. 2, 1970, Ser. No. 94,377
Int. Cl. B67d *5/36*
U.S. Cl. 137—351 **10 Claims**



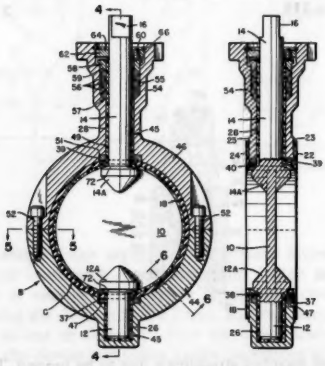
A pair of air lines including rigid portions connected together in the form of a pantograph adapted to be carried by a vehicle in a retracted position and extended for use and having a flexible air hose connected to each end of the outer ends of the rigid portions for connection to the airplane to provide air for starting the airplane engines. A self-propelled vehicle having an air generating means and a pivoting air manifold connected to and carrying a pair of air lines including a plurality of rigid portions connected together in the form of a pantograph with means for pivoting the air manifold and means for expanding the pantograph towards an airplane and retracting the pantograph towards the vehicle for carrying with flexible air hoses connected to the outer ends and casters on one side of the pantograph for supporting the air hoses as they move along the ground.

3,661,171

BUTTERFLY VALVE

Russell G. Smith; William G. Sonderman, and Paul D. Templin, all of Cincinnati, Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed May 12, 1970, Ser. No. 36,643
Int. Cl. F16k *1/226*
U.S. Cl. 137—375 **23 Claims**



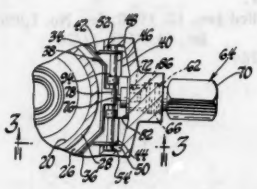
A pre-formed flexible protective liner characterized by its durability, resistance to corrosion, and inherent self-lubricating qualities, is disposed between the body bore and the valving member of a butterfly valve; and resilient back-up means are provided between the body bore and liner for yieldably expanding the liner into fluid-tight sealing relationship with the valving member periphery when in closed position.

3,661,172

HINGE PIN RETAINER CLIP

Robert J. Miller, 28924 Ursuline, St. Clair Shores, Mich.

Filed Jan. 26, 1970, Ser. No. 879,892
Int. Cl. F16k *31/18*
U.S. Cl. 137—434 **7 Claims**



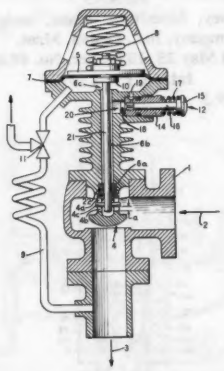
A carburetor having a body with a fuel reservoir, fuel inlet valve assembly, a float within the fuel reservoir connected to a lever assembly and a hinge pin operatively connected to the lever assembly and received within support recesses formed in the reservoir, has a relatively resilient clip having relatively resilient arcuate arms engaging the hinge pin, a tab carried by the clip abuttingly engages a clearance passageway formed about the fuel inlet valve assembly and effectively resiliently urges the clip and arms downwardly against the hinge pin in order to hold it in assembled relationship within the recesses; an aperture formed through the clip body permits the extension therethrough of the fuel inlet valve assembly if such is necessary.

3,661,173

HIGH SPEED STOP VALVE

Helmut Bauer, Basel, Switzerland, assignor to Airco, Inc., New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,817
Claims priority, application Switzerland, Jan. 31, 1969, 1553/69
Int. Cl. F16k *17/24*
U.S. Cl. 137—462 **6 Claims**



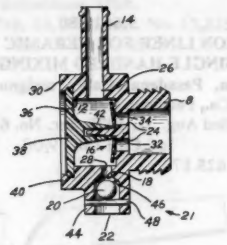
This invention relates to a high-speed valve positioned in a pipe normally conducting liquid oxygen under pressure. The valve is actuated to a closed position when there is a pipe failure with attendant pressure drop.

3,661,174

CHECK VALVE WITH MEANS FOR RELIEVING FLUID PRESSURE FROM THE CONTROL CHAMBER

Maxwell L. Cripe, South Bend, Ind., assignor to The Bendix Corporation

Filed Aug. 5, 1970, Ser. No. 62,238
Int. Cl. F16k *15/14*
U.S. Cl. 137—512.3 1 Claim



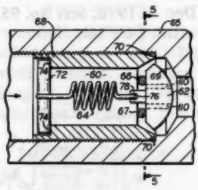
A check valve for a power braking system having a housing containing a flexible member in a control chamber. The flexible member overlies an inlet to the system and permits fluid flow only from the system to the control chamber. An outlet port is connected to the vacuum of the manifold of an automobile. A tubular projection adjacent an opening in the control chamber contains a ball member which is loosely held in position by a pin member in the projection. The loosely held ball member will permit present at the manifold resulting from the operation of the car and carried to the control chamber to escape to the atmosphere around the ball without damaging the system.

3,661,175

CONTAMINATION RESISTANT FLUID FLOW FUSE

Alfred Tillman, Mount Tabor, N.J., assignor to Marotta Scientific Controls, Inc., Booton, N.J.

Filed May 25, 1970, Ser. No. 40,297
Int. Cl. F16k *17/34*
U.S. Cl. 137—517 12 Claims



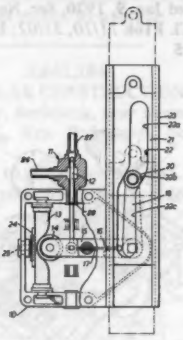
This specification discloses a fluid flow fuse, including some modified constructions, with a valve element that moves between open and closed positions without the use of any close fitting guide for the valve element. The valve element is loose in the passage that it controls so that when the valve element remains continuously in open position for long periods of time, contamination deposits that accumulate in the passage (particularly in water passages) do not stick the valve element to a guide so that it can not operate when fluid flow in the passage reaches a velocity at which the fuse was originally designed to close. Abutments with which the valve element contacts when yieldably held in open position have line contact, or small areas of contact with the valve element, so that the valve element can not become firmly stuck to its limit stops.

3,661,176

LEVELING VALVE

Charles B. Lowe, Parklands, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 27, 1970, Ser. No. 67,462
Claims priority, application Great Britain, Sept. 3, 1969, 43,602/69
Int. Cl. F16d *63/00*
U.S. Cl. 137—560 7 Claims



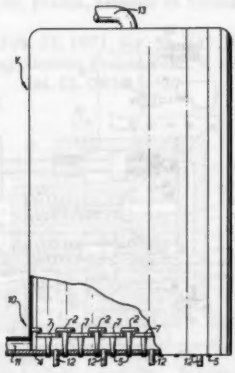
A leveling valve for use in an air-suspension system of a vehicle seat. An air-flow control valve is operated by displacement of a seat part. A damper, comprised of a roller biased laterally into a flexible tube containing fluid and traveling parallel to the tube introduces a delay into the operation of the leveling valve in response to movement of the seat part.

3,661,177

FLUID DISTRIBUTORS

Gerald Moss, Oxford, and Graham L. Johnes, Wantage, both of England, assignors to Esso Research and Engineering Company

Filed May 12, 1970, Ser. No. 36,586
Claims priority, application Great Britain, May 14, 1969, 24,581/69
Int. Cl. F17d *1/10*
U.S. Cl. 137—574 9 Claims



A distributor for distributing fluids substantially uniformly into a hollow vessel for physical and/or chemical process, the distributor having two layers of tiles. The bottom layer of tiles generally fit together but leave apertures in the layer

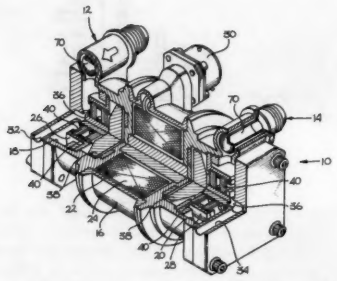
from place to place for the passage of fluid, and each tile in the upper layer is located over, and spaced from a respective aperture, so that fluid passing through the apertures is deflected substantially uniformly over the top of the bottom layer of tiles.

3,661,178

MAGNETICALLY LINKED BIPROPELLANT VALVE

Horst Wichmann, Canoga Park, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Jan. 9, 1970, Ser. No. 1,738
Int. Cl. F16k *11/10, 31/02*; H01f *7/06*
U.S. Cl. 137—595 **17 Claims**



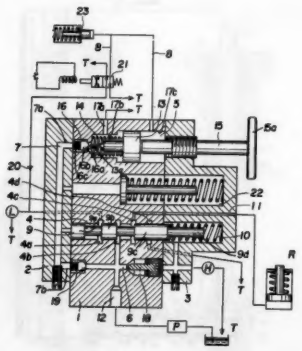
A plurality of valve elements, each valve element functioning to open and close a fluid passage, all valve elements operating simultaneously by a common magnetic field, each valve element being supported by an axial guidance flexure comprising a plurality of discs with spaces therebetween, each disc having a plurality of grooved cut-out sections which permit limited axial movement of the outer circumference of the disc with respect to the inner portion of the disc.

3,661,179

AUTOMATIC OIL PRESSURE SWITCH VALVE

Kingo Hasumi, Omiya, Japan, assignor to Sanwa Tetsuki Kogyo Kabushiki Kaisha, Tokyo-To, Japan

Filed June 9, 1970, Ser. No. 44,750
Claims priority, application Japan, Feb. 20, 1970, 45/14175
Int. Cl. F16k *11/10*
U.S. Cl. 137—596.12 **1 Claim**



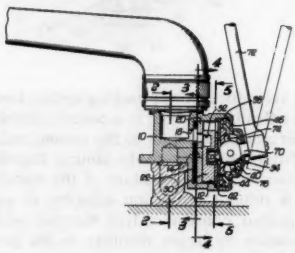
An automatic oil pressure switch valve adapted to an oil supply system and being operative by pushing merely the switch for regulating an electro-magnetic switch valve whereby an oil pressure press is actuated and when a desired pressure is attained, a ram is moved backward to stop the press so that only a pushing of the switch is sufficient each time to fix the means being handled and hence there occurs no excessive strain on the switch valve to actuate so that such component will not easily break down. A pilot pressure is regulated by being introduced into a low pressure passage from an extraordinarily high pressure pump whereby a satisfactory precision of regulation is possible without employing a special electro-magnet and pressure switch.

3,661,180

ANTIFRICTION LINER FOR CERAMIC VALVE PLATES OF SINGLE-HANDLED MIXING VALVE

John K. Lyon, Pasadena, Calif., assignor to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Filed Aug. 31, 1970, Ser. No. 68,075
Int. Cl. F16k *19/00*
U.S. Cl. 137—625.17 **3 Claims**



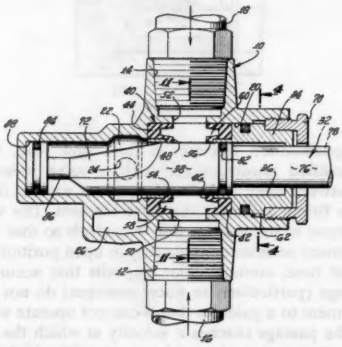
A ceramic valve plate is provided with a plastic liner cap that cooperates first, with the operating arm so as to minimize contact pressure and second, with a plastic back bearing so as to minimize sliding friction. The operating arm carries a cylindrical cross bar that fits into the recess of the valve plate lined by flanges of the liner cap.

3,661,181

LIP SEALING MIXING VALVE FOR LAVATORIES, SINKS, ETC.

Patsy B. Palmer, Granada Hills, and Julius L. Tolnai, Los Angeles, both of Calif., assignors to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Filed Dec. 7, 1970, Ser. No. 95,506
Int. Cl. F16k *19/00*
U.S. Cl. 137—625.17 **9 Claims**



This invention relates to a single-handled valve for controlling both combined volume and relative proportion of hot and cold water. A control valve stem extends through a

moldable sleeve-like sealing member, the sleeve-like sealing member cooperating with hot and cold water inlet openings. The axial and angular positions of the stem determine the combined volume and relative proportion while the sleeve-like sealing member performs all of the sealing functions between the inlet openings and the valve outlet.

3,661,182

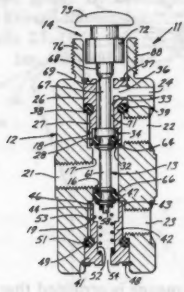
FOUR-WAY VALVE WITH BLOCKED CENTER

Stanley M. Loveless, Oshtemo, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Feb. 24, 1970, Ser. No. 13,325

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.48 **11 Claims**



A valve assembly having a valve spool shiftably mounted within a housing and provided with an alignment sleeve surrounding the spool. The alignment sleeve is supported on the housing by a resilient seal ring for permitting limited relative movement between the sleeve and the housing. The alignment sleeve and the housing define axially therebetween a narrow ring-like passage surrounding the valve spool for providing communication between a pair of ports formed in the housing. The valve spool has a resilient seal ring positioned thereon, which seal ring is adapted to completely cover the ring-like passage when the valve spool is shifted between its extreme positions.

3,661,183

ELECTROMAGNETICALLY OPERATED VALVE WITH TWO SEATS

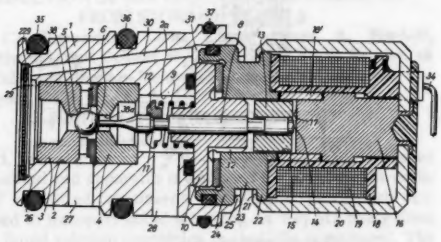
Iwan Komaroff, Korntal; Ewald Ziegler, Leonberg, and Waldemar Hans, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 12, 1970, Ser. No. 45,825

Claims priority, application Germany, July 15, 1969, P 19 34 212.2

Int. Cl. F16k *31/06*

U.S. Cl. 137—625.65 **7 Claims**



An electromagnetically operated valve wherein a spherical valve member normally engages one of two seats to thereby connect a port for spent fluid with a port which is connected with a consumer of pressurized fluid. The valve member is held in such position by the plunger of an armature which is accommodated in a fluid-filled chamber provided in the valve housing and communicating with a fluid-admitting port. When the winding of the electromagnet is energized, the plunger is retracted to permit movement of the valve member into engagement with the other seat whereby the port which is connected to the consumer communicates with the fluid-admitting port. The plunger can be held in a position in which the valve member engages the one seat by fluid pressure in the chamber and/or by a spring.

3,661,184

TUBULAR CONSTRUCTION

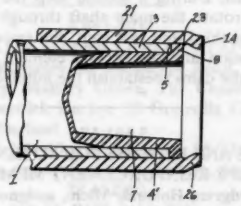
Wilhelm Lachenmayer, Berlebeck, near Germany, assignor to Benteler-Werke AG, Krs. Paderborn, Schloss Neuhaus, Germany

Filed Oct. 10, 1969, Ser. No. 865,283

Claims priority, application Germany, Nov. 26, 1968, P 18 10 957.4

Int. Cl. F16l *57/02*; B65d *59/02*

U.S. Cl. 138—89 **11 Claims**



An elongated tubular member having open ends with radial end faces surrounding the respective open ends. A corrosion-resistant and protective plug member having a flange portion is received in each of the open ends with the flange portion overlying the respective radial end face. An insulating jacket surrounds the tubular member and has its end portions formed into radially inwardly extending circumferential beads which abut against and are sealed to the respective flange portions of the plug members so as to fixedly secure the latter in the open ends.

3,661,185

DRIVING DEVICES FOR LOOM SHED-FORMING MECHANISMS

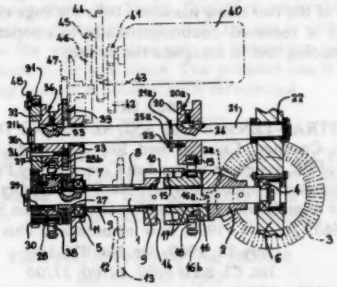
Joseph Fumat, Lyon, France, assignor to Verdol S. A., Rhone, France

Filed Feb. 22, 1971, Ser. No. 117,303

Claims priority, application France, Mar. 9, 1970, 7008259

Int. Cl. D03d *51/00*

U.S. Cl. 139—1 E **8 Claims**



A device to be inserted between a loom and its shed-forming mechanism to permit of rotating the latter backward or

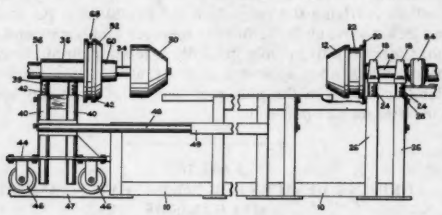
forward independently of the loom when required and thereafter to resume normal weaving with proper timing of the mechanism with respect to the loom, comprises a rotating member connected with the loom so as to effect one revolution for each pick thereof, a single-tooth clutch to connect this member with a main shaft connected with the shed-forming mechanism, during normal weaving, and coupling means to connect the said main shaft with a gearing adapted to rotate this shaft by successive complete revolutions. These coupling means include a first element rigidly carried by the said shaft, and a second element which may be engaged with or disengaged from the first one. The gearing comprises a driving gear wheel having a toothed sector and a smooth blocking sector, and a corresponding pinion having a toothed sector and a concave depression to receive the smooth blocking sector. The pinion is affixed to the second element of the coupling means, while the gear wheel is carried by an auxiliary driving shaft connected with an appropriate auxiliary motor, and this shaft carries cams adapted to control the single tooth clutch and the coupling means. When the auxiliary motor is started, during a first step the second element of the coupling means is blocked by the smooth sector and the cams disconnect the main shaft from the rotating member and connect it with the second element of the coupling means. During a second step the toothed sectors cooperate to rotate the main shaft through one revolution. Then during a third and last step, the smooth sector again blocks the pinion and the second element of the coupling means, while the cams reestablish the initial connections.

3,661,186

APPARATUS AND PROCESS FOR MAKING CONCRETE PIPE REINFORCEMENT MEMBER

Alfred A. Nordgren, Holland, Mich., assignor to W. E. Dunn Manufacturing Company, Holland, Mich.

Filed Dec. 29, 1969, Ser. No. 888,466
Int. Cl. B21f *15/08, 33/00*
U.S. Cl. 140—107 **13 Claims**



Apparatus for and a process of welding and forming metal grid work into a reinforcing cage, having a driven mandrel and two idling mandrels, the latter of which are axially adjustable relative to each other and to the driven mandrel by means of a hydraulically actuated sleeve telescoping over the idling shaft and a hydraulically actuated carriage, respectively. One of the two idling mandrels bells the cage end, and this mandrel is recessed circumferentially to cooperate with a hand bending tool to complete the belling.

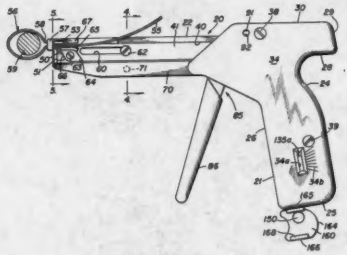
3,661,187

STRAP-TENSIONING AND SEVERING TOOL

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Continuation of application Ser. No. 772,441, Oct. 21, 1968, now abandoned , Continuation of application Ser. No. 474,563, July 26, 1965, now abandoned. This application July 28, 1969, Ser. No. 870,190
Int. Cl. B21f *9/00, 11/00, 21/00*
U.S. Cl. 140—123.6 **27 Claims**

There is disclosed a hand tool for tensioning and severing straps of the type used in binding bundles of wires into cables, such straps including a connector adjacent one end thereof and the other end being free and adapted to be wrapped around the bundle to be bound and thereafter slid through the connector in a tightening movement, the tensioning and severing tool has a pair of jaws, one of which engages the connector and the other of which engages the free strap and extending beyond the connector, drive mechanism for tensioning the strap by moving the jaws apart and for thereafter actuating a strap-severing blade after the application of a predetermined force between the jaws, the tool of the present invention including mechanism for applying a restraining force upon the severing blade drive mechanism of a character which will prevent blade severing movement until the aforementioned predetermined tension is reached in the



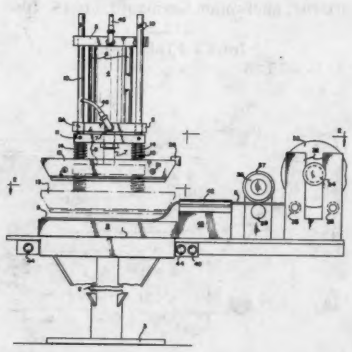
strap, after which means is provided that serves substantially instantaneously to relieve or reduce the restraining force in the blade drive mechanism, whereby the blade drive mechanism immediately and quickly actuates the blade to sever the strap; a combined trigger-type drive mechanism is provided which ensures that the same tension is produced in the strap at the cut-off no matter how the handle actuating the drive mechanism is gripped by the user; the blade drive mechanism is such that immediately upon cut-off, and before the blade actually cuts through the entire strap, the drive tension is released so that the blade never strikes the anvil or backup for the strap; finally, a novel adjustment mechanism is provided for adjusting the predetermined tension at which cut-off of the free strap end is effective.

3,661,188

MACHINE FOR INSERTING WIRE SCREENING

Harold E. Gaug, 3907 Gibbons Street, Vancouver, Wash.

Filed May 8, 1970, Ser. No. 35,743
Int. Cl. B21f *33/02*
U.S. Cl. 140—109 **5 Claims**



A machine including a foot assembly for powered movement downwardly into close confinement within an opening

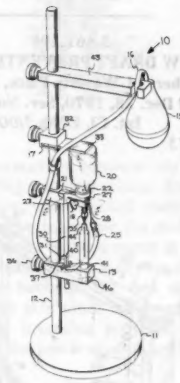
within which the wire screening is to be installed. Laterally displaceable injectors act to forcefully engage marginal screen segments and drive same into the walls defining the opening. Cooperating wedge shaped components translate downward movement of the foot assembly to lateral injector movement and spring means retract the screen injectors to permit foot assembly removal from the opening. Also disclosed is screen supply arrangement for advancing screen into place on the block. A method of screen placement is also disclosed.

3,661,189

LIQUID DISPENSER

Gary L. Bowser, and Roger D. Lenhardt, both of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed June 23, 1970, Ser. No. 49,070
Int. Cl. B65b *3/14*
U.S. Cl. 141—1 **7 Claims**



Method and apparatus for dispensing a precise amount of liquid from a sealed container into a syringe, open at one end, without engaging the syringe plunger. A positive and negative pressure is successively applied to the liquid in the sealed container forcing it through a conduit into the syringe. The predetermined position of the conduit in the syringe determines the level of the liquid in the syringe.

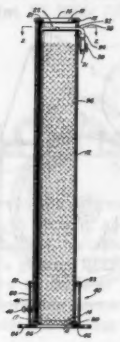
3,661,190

REDUCTION OF AIR CONTAMINATE EMISSIONS FROM STORAGE VESSELS

Neal C. Burmaster, Yorba Linda; Bruce A. Harbolt, Northridge, and Delbert W. Block, Palos Verde Estates, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 11, 1970, Ser. No. 71,307
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—11 **8 Claims**

A method and apparatus is disclosed for reducing the emission of volatilized constituents from vessels, particularly vessels used to transport liquid solutions, as they are being filled with a liquid solution containing the volatile constituent. The apparatus comprises a packed column having universal means to temporarily mount the column in a vertical position over a vapor discharge port of the vessel with means to introduce solvent into the column in countercurrent flow therein to the vessel vapor effluent. The solvent from the column enriched with the volatile constituent is discharged directly into the vessel and the purified gas effluent is released to the atmosphere.

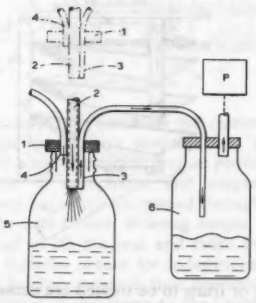


3,661,191

APPARATUS FOR FILLING CONTAINERS

Gerald Brunswick Harley, 8a Landscape Road, Warlingham; Graham Harley, Mallory Grove, The Chase, Kingswood, and Peter Brunswick Harley, 32 Grenville Court, Rymen, London, all of England

Filed July 17, 1970, Ser. No. 55,730
Claims priority, application Great Britain, Aug. 6, 1969, 39,412/69
Int. Cl. B65b *3/18, 3/30*
U.S. Cl. 141—41 **6 Claims**



Apparatus, particularly for filling bottles with liquid, is provided with a device both for withdrawing gas from above the liquid entering the bottle and for simultaneously supplying gas to the space above the liquid. Therefore, when the liquid rises to a suction probe through which the gas is withdrawn, and so stops the withdrawal of gas, an immediate gas pressure rise occurs in the said space. This pressure rise is sensed and the filling operation consequently terminated.

3,661,192

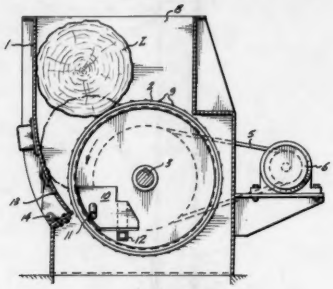
PERIPHERAL CHIPPER FOR ROUND LOG SECTIONS

Thomas W. Nicholson, Mercer Island; Ray B. Jorgensen, and Stanley Donald Vanek, both of Seattle, all of Wash., assignors to Nicholson Manufacturing Company, Seattle, Wash.

Filed Dec. 8, 1969, Ser. No. 883,038
Int. Cl. B27l *11/02*
U.S. Cl. 144—176 **6 Claims**

A rotating chipping drum carrying a spiral row of bits is mounted in a hollow body with a portion of its periphery ex-

posed to a chipping chamber for holding log sections to be chipped. The rotative axis of the chipping drum may be inclined to urge a log section toward one end of the chipping chamber. Each bit includes side plate portions arranged at dihedral angles to a central plate portion and is clamped between bit-holding blocks with the bit cutting edge projecting beyond the periphery of the chipping drum.



3,661,193

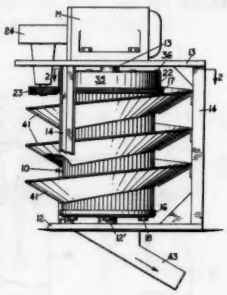
MACHINE FOR REMOVING STEMS AND CAPS FROM CERTAIN BERRIES AND FRUITS

Robert D. McLauchlan, 1145 Lancaster Drive, Salem, Oreg.

Filed June 29, 1970, Ser. No. 50,732

Int. Cl. A23n *15/02*

U.S. Cl. 146—55 **1 Claim**



The berries or fruits to be treated are caused to move in a spiral downwardly-extending path in constant contact with a series of individually rotating rollers forming the wall of a cylindrical drum assembly, while the cylindrical drum assembly as a whole is rotated on a vertical axis. The rollers in the cylindrical drum assembly are arranged in pairs with the rollers in each pair rotating oppositely and having cooperating surfacings so as to cause contacted stems and caps to be drawn between them and removed.

3,661,194

PREVAILING TORQUE FASTENER

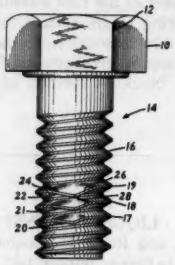
Donald B. Macfarlane, Troy, and Gary T. Rathka, Sterling Heights, both of Mich., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Jan. 2, 1970, Ser. No. 257

Int. Cl. F16b *39/30*

U.S. Cl. 151—22 **11 Claims**

A prevailing torque fastener including a threaded section having a plurality of thread convolutions and a leading end that makes initial engagement with a mating thread when the fastener is tightened on a mating member. Some of the thread convolutions have a projection formed thereon extending axially of the fastener toward the leading end of the threaded section. The projections progressively increase in size from the leading end of the fastener so that the projections nearer the leading end are smaller than the adjacent projections nearer the other end of the fastener.



3,661,195

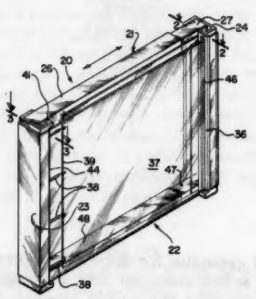
WINDOW DRAFT PREVENTING DEVICE

Emanuel M. Fischer, 11 Waverly Place, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,452

Int. Cl. E06b *3/00*

U.S. Cl. 160—373 **2 Claims**

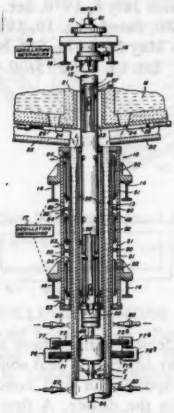


This window draft preventing device is of an adjustable spring biased construction including upper and lower spring biased frame assemblies joined together at their outer ends by upwardly extending end frame members of which a closure sheet of plastic and transparent material is extended and wrapped to make two or more passes between the end frame members with one end of the closure sheet being anchored to one of the end frame members and the free end of the closure sheet being anchored to the other member through spring tension means. The frame members may be either of square or rectangular section or of tubular section seen with the different forms of the device and the connection to the end frame members of the ends of the closure sheet may be effected through vertically extending rods connected either to the end frame members or to the top and bottom members. One of the end frame members may include a curtain-like tension roll as a tensioning means for the closure sheet. The closure sheet sufficiently long and arranged to have actual engagement with the side faces of the window frame at either the lower window or upper window and also provision is made for effecting a detachable sealing engagement of the upper and lower edges of the closure sheet with the upper and lower frame assemblies.

3,661,196
METHOD AND APPARATUS FOR CONTINUOUSLY CASTING HOLLOW ROUNDS

Karl E. Kummant, Amherst, Ohio, assignor to United States Steel Corporation

Filed Oct. 2, 1970, Ser. No. 77,470
Int. Cl. B22d 11/02
U.S. Cl. 164—85 9 Claims

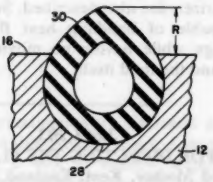


A method and apparatus for continuously casting a hollow round for manufacturing seamless tubing. Apparatus includes an open-ended tubular water-cooled mold and a tubular water-cooled lance suspended within the mold, leaving an annular cavity therebetween. Molten metal is poured into the cavity. Outside and inside skins solidify on the metal, at first leaving a liquid core between the two skins. There is a problem that the inside skin tends not to remain concentric with the outside skin. Invention provides magnetic means acting on plugs within the inside skin to hold the two skins in a concentric relation.

3,661,197
COREBOX AND SEAL

Edwin F. Peterson, 119 Main Street, Neponset, Ill.

Filed Feb. 9, 1970, Ser. No. 9,899
Int. Cl. B22c 7/06
U.S. Cl. 164—228 6 Claims

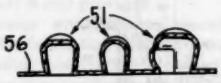


A seal for surrounding the cavity in a core box made up of a pair of mating members meeting at an interface in which a cavity-surrounding channel of greater than semicircular section is formed in but one of the members. The channel carries coextensively therewith a tubular elastomer seal of somewhat greater diameter than the channel so as to initially project from the channel in parabolic fashion, the parabolic portion being deformed into the channel as the two members are brought tightly together.

3,661,198
APPARATUS FOR MAKING PONTIC CORES

Roger A. Evenson, 3607 May Lane, San Jose, Calif.

Filed Jan. 31, 1969, Ser. No. 795,563
Int. Cl. B22c 7/02
U.S. Cl. 164—246 5 Claims

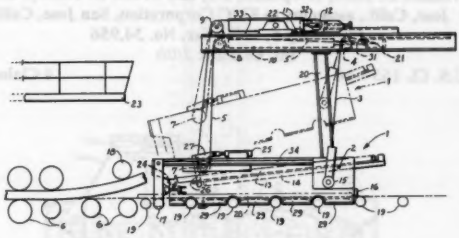


This invention relates to the preparation of artificial teeth. Significant reductions in weight and cost of pontics are achieved by using a hollow metallic core filled with porcelain. The tooth has a greater flexural strength because of the greater compressive strength of the procelain filling in the metallic core. Vaporizable forms for making the hollow metallic cores are provided in various sizes in sheet form.

3,661,199
DUMMY BAR STORAGE APPARATUS

Georg B. Bollig, Buederich, Germany, assignor to Schloemann Aktiengesellschaft, Duesseldorf, Germany

Filed Oct. 21, 1969, Ser. No. 868,029
Int. Cl. B22d 11/08
U.S. Cl. 164—274 6 Claims



In a continuous-casting machine the dummy bar storage apparatus comprises a frame movable into the path of a dummy bar and a rocker storage section pivoted at the rear, downstream end of said frame and adapted to receive thereon a dummy bar which has passed through a withdrawal roll unit for the cast strand. Hoisting means for lifting the frame is adapted to lift the rear end twice as much as the front end and includes means for independently lifting the front end. The hoisting means is thus operable for adjusting the angular position of the frame to the angular position of the dummy bar emerging from the withdrawal roll unit and also for lifting the front end of the frame for disconnecting the dummy bar from the cast strand.

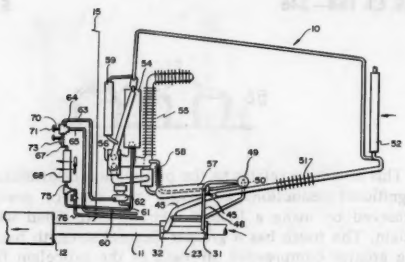
3,661,200
ABSORPTION REFRIGERATION AND AIR CONDITIONING SYSTEM

Thomas J. McNamara, 317 Harding Ave., Des Plaines, Ill.

Filed Nov. 17, 1969, Ser. No. 877,373
Int. Cl. B60h 3/00
U.S. Cl. 165—42 7 Claims

An absorption refrigeration and air conditioning system using a mixture of water and ammonia and helium to maintain a constant vapor pressure and wherein the system uses a generator for the refrigeration circuit which is fitted to the exhaust line of a vehicle and wherein the space to be cooled or refrigerated has a heat transfer unit. This unit is supplied with a liquid from a chiller in the refrigeration circuit and with liquid from a cooling system of the vehicle, with both

liquids including an anti-freeze mixture, such as ethylene glycol and wherein a mixing valve controls the mixture of the liquids from the two sources to provide a desired temperature within the space to be cooled.

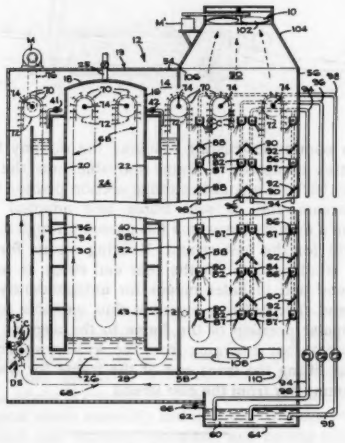


3,661,201

EVAPORATIVE COOLING SYSTEM FOR HYDROSTATIC COOKER

Winston D. Bash, Hoopeston, Ill., and Frank D. Hickey, San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 6, 1970, Ser. No. 34,956
Int. Cl. F28c *3/00*
U.S. Cl. 165—60 **4 Claims**



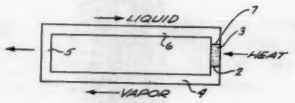
An evaporative cooling system for a hydrostatic cooker having an endless conveyor for moving rows of hot containers along a vertical zig-zag path through a vertically elongated cooling chamber. The system includes a plurality of vertically spaced troughs for directing cooling water against hot containers being processed, a sump for collecting the cooling water, pumps for recirculating the cooling water from the sump to the troughs, and means for adding make-up water to the sump. The system also includes a high volume-low velocity exhaust fan mounted on the upper end of the cooling chamber for drawing air upwardly through the cooling chamber to reduce the pressure within the cooling chamber below atmospheric and thereby increase the rate of evaporative cooling to such an extent that the cooling temperature becomes stable and make up water is required only to compensate for water loss through evaporation.

3,661,202

HEAT TRANSFER APPARATUS WITH IMPROVED HEAT TRANSFER SURFACE

Robert David Moore, Jr., 817 West Camino Road, Arcadia, Calif.

Original application July 6, 1970, Ser. No. 52,642, now Patent No. 3,598,180, dated Aug. 10, 1971. Divided and this application May 14, 1971, Ser. No. 143,459
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **20 Claims**



A heat transfer device, defined here as a heat link, having a capillary vaporizer adjacent a heat source, transfers heat to a heat sink by vaporization and condensation of a heat transfer fluid within the device. A first passage is provided for conveying vapor from the capillary vaporizer to the heat sink. Another passage which is essentially a continuation of the first passage, conveys condensed liquid from the heat sink to the vaporizer, thus allowing the distance that the liquid must flow through capillary material to be quite short. Contact of the returning liquid with the surface of the vaporizer is assured by providing means for maintaining the temperature of the liquid in the return line at a sufficiently low temperature that any vapor will condense; or, alternatively, by having means for extracting any vapor formed in the returning liquid. In this manner, the heat link operates with high heat flux without any substantial resistance to liquid flow through a long capillary flow path. By thus replacing almost all of the liquid return wick, with its high resistance to fluid flow, of heat pipes with a low flow resistance liquid passage or conduit, the heat flux capacity of the heat link is greatly increased over that of the heat pipe while the quantity of porous material used and the heat link weight are considerably reduced so that a heat link typically has 10 to 1,000 times the heat flux capacity of a heat pipe having the same weight. "Boosted" embodiments of the heat link employing additional means for circulating the fluid, such as vapor jet pumps, powered at least in part by vapor from the capillary vaporizer, are also described. Some "boosted" heat links are capable of handling heat fluxes in the multi-megawatt range while having no moving parts except for check valves and the fluid itself.

3,661,203

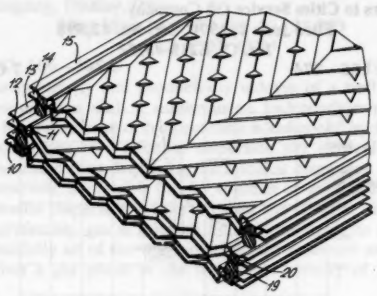
PLATES FOR DIRECTING THE FLOW OF FLUIDS

Terry Bernard Mesher, Kent, England, assignor to Parkson Corporation, Fort Lauderdale, Fla.

Filed Nov. 21, 1969, Ser. No. 878,607
Int. Cl. F28b *3/08*
U.S. Cl. 165—167 **5 Claims**

A plate for directing the flow of fluids which is shaped so as to provide contact points capable of spacing it from and supporting it against similar plates, is also provided with further contact points so that by suitable arrangement of the plates, the spacing therebetween can be varied. The basic contact points on the standard plate are provided by a herring-bone pattern of V-shaped hill and valley corrugations and, preferably, the further contact points are formed by

stamping the plate so that portions of the hill structure of the corrugations are provided with reversed hill and valley formations, although they may be formed by studs or projections attached to the plate.



3,661,204

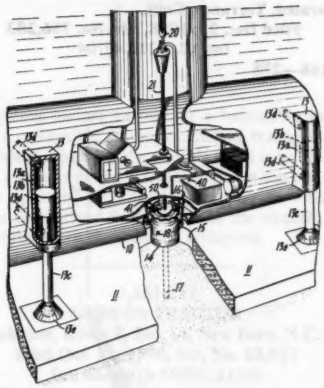
UNDERWATER DRILLING METHODS AND APPARATUS

John E. Blanding, Old Lyme, Conn.; Edmund C. Trageser, Webster, N.Y., and James Vincent Harrington, Groton, Conn., assignors to General Dynamics Corporation, New York, N.Y.

Original application Sept. 11, 1967, Ser. No. 671,532, now Patent No. 3,503,443, which is a division of application Ser. No. 193,040, Apr. 26, 1962, now Patent No. 3,353,364, which is a continuation-in-part of application Ser. No. 81,543, Jan. 9, 1961, now abandoned. Divided and this application Mar. 23, 1970, Ser. No. 21,976

Int. Cl. E21b *7/12, 43/01*

U.S. Cl. 166—.5 **18 Claims**



Broadly, three embodiments are disclosed: a first involving drilling a well from a submersible vessel, a second specifically adapted to drilling a well in shallow water, and a third specifically adapted to drilling a well in deep water. In the second and third embodiments, drilling may be accomplished by workmen on the surface of the water.

In each embodiment, an anchor pad is first installed at the selected site of the wellhead. Means is disclosed for performing the cementing of the anchor pad underwater. Drilling is effected through a hollow, watertight capsule, which is secured directly or indirectly to the anchor pad, and casing is lowered into the well. In the second and third embodiments, casing extension is mounted on the wellhead within the capsule and run to the surface of the water.

After completion of the drilling operation, the casing extension, if used, is removed, a christmas tree is installed in the capsule, and the capsule is sealed to protect the wellhead during the production cycle.

A service chamber facilitates return of workmen periodically to the capsule for inspection and repair. Chambers and adaptors facilitating underwater separation of oil and gas and storage of the oil are provided, and a floating production buoy facilitating support of wellhead equipment and product collection by a tanker is also provided.

Hydraulic apparatus with suitable electrical actuating means is disclosed for facilitating remote control of a number of operations including positive hold-down of one chamber mounted underwater atop another, sealing of one chamber to another, raising and lowering of the christmas tree within the capsule, and the coupling together of product-bearing lines in one chamber to product-bearing lines in an adjacent chamber.

3,661,205

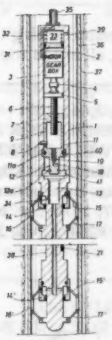
WELL TOOL ANCHORING SYSTEM

Roger Belorgey, Taverny, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 16, 1971, Ser. No. 134,775

Int. Cl. E21b *43/00, 23/00*

U.S. Cl. 166—65 R **10 Claims**



An illustrative embodiment of the invention includes upper and lower anchoring members for temporarily securing a well tool in a well bore. The upper and lower anchoring members are pivotally supported from the central body member of the tool and respectively coupled to upper and lower movable slide blocks or driven pistons. The slide blocks are, in turn, moved by a two phase hydraulic transmission system whose pressure is controlled by a movable driving piston having two different cross sectional piston areas. The driving piston's motion is provided by a reversible electric motor via a gear box and threaded driving screw. This arrangement provides for low pressure fast moving initial deployment of the anchoring means followed by subsequent high pressure, low displacement anchoring force.

3,661,206

UNDERWATER COMPLETION EXPANDING TUBING HANGER

Samuel W. Putch, and Carl R. Hutchison, both of Houston, Tex., assignors to FMC Corporation, San Jose, Calif.

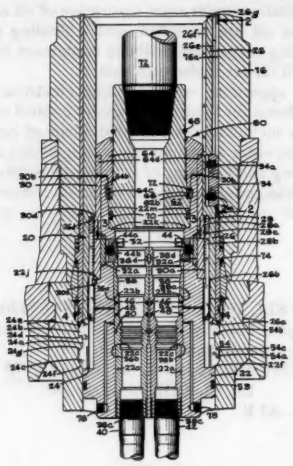
Filed July 13, 1970, Ser. No. 54,527

Int. Cl. E21b *33/03, 23/00*

U.S. Cl. 166—85 **27 Claims**

An apparatus for suspending a string of pipe in an oil or gas well at the wellhead, and particularly for hanging one or more tubing strings in the casing head of an offshore underwater well. Included are an assembly for hanging the tubing strings, a tool assembly for running and retrieving the tubing hanger assembly, and a tool assembly for running and

retrieving a tubing hanger coupling and for completing the well. The apparatus facilitates running, aligning, and landing



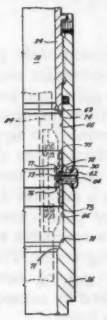
all the tubing strings, pressure testing the tubing hanger, and locking the hanger down, all in one trip.

3,661,207

SLIDING SLEEVE ASSEMBLY FOR A HYDRAULICALLY SET WELL PACKER

James H. Current, and Marion D. Kilgore, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Nov. 27, 1970, Ser. No. 93,112
Int. Cl. E21b *23/06, 33/12*
U.S. Cl. 166—120 **5 Claims**



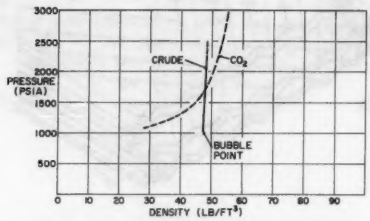
A sliding sleeve assembly for opening the setting port of a hydraulically set well packer which may be positioned for actuation in either an upwardly or downwardly direction. A shearable plug initially blocking the setting port and positioned in an elongate recess in the packer which extends equal distances on either side of the setting port with a shoulder at each end of the recess and a sliding sleeve telescopically positioned in the recess and in engagement with the plug whereby when the sleeve is longitudinally moved the plug is sheared. The sleeve including two actuation shoulders facing in opposite directions for moving the sleeve in either direction. The shoulders at the ends of the recess being tapered for retracting a setting tool after the sleeve is shifted in the recess.

3,661,208

CONTROL OF GRAVITY SEGREGATION BY HIGH DENSITY FLUID INJECTION

J. O. Scott, and Charles L. Hern, both of Tulsa, Okla., assignors to Cities Service Oil Company

Filed June 2, 1970, Ser. No. 42,898
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **7 Claims**



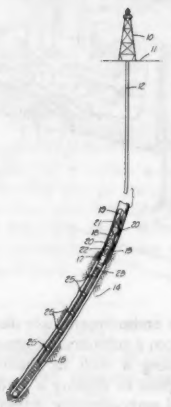
Gravity segregation is controlled and oil recovery enhanced by the controlled injection of a high density miscible fluid, such as carbon dioxide, into an oil bearing formation. Pressure within the formation is maintained so that the density of the injected fluid is equal to or as close to that of the oil as possible. Generally, the density of the miscible fluid should be maintained within about 10 percent of the density of the oil to be displaced. Mixtures of the miscible fluid and displaced oil are produced from the lower portions of the reservoir so that the miscible fluid will sweep the entirety of the reservoir and thereby avoid bypassing oil by gravity segregation of oil and miscible fluid.

3,661,209

METHOD FOR COMPACTLY PLACING MATERIAL IN A WELL

James R. Solum, Huntington Beach, Calif., assignor to B & W Incorporated, Torrance, Calif.

Filed Dec. 23, 1968, Ser. No. 786,283
Int. Cl. E21b *43/04*
U.S. Cl. 166—278 **4 Claims**



A method for compactly placing a material such as gravel in a well bore exteriorly of a casing at a substantial depth by vibrating the stationary casing through the use of one or more devices positioned in the casing that are actuated by manipulation, rotation or reciprocation, of a drill pipe extending to the surface of the well. The device includes a member which is spring biased and movable relative to the drill pipe with a latch element for repeatedly biasing and releasing the member to impact the casing during continued manipulation of the drill pipe.

3,661,210

INCREASING INJECTIVITY AND PRODUCTIVITY INDEXES OF A GAS WELL

Walter B. Kirk, Robinson, Ill., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 19, 1970, Ser. No. 21,203
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 D 16 Claims

The injectivity and productivity indexes of a well in fluid communication with a subterranean hydrocarbon reservoir used for the storage of hydrocarbon is enhanced by injecting 1–500 gallons of a micellar dispersion per vertical foot of reservoir and then displacing the micellar dispersion out into the reservoir. Preferably 0.1–50 volumes of water per volume of micellar dispersion is injected after the micellar dispersion and preferably gas is injected behind the water to displace substantially all of the water out into the reservoir and to re-establish a gas phase in the immediate vicinity of the well bore.

3,661,211

FIREFIGHTING APPARATUS

Gene A. Powers, Greybull, Wyo., assignor to Powers and Hawkins Enterprises, Inc., Greybull, Wyo.

Filed June 17, 1970, Ser. No. 46,929
Int. Cl. A62c *31/00*
U.S. Cl. 169—2 R 11 Claims

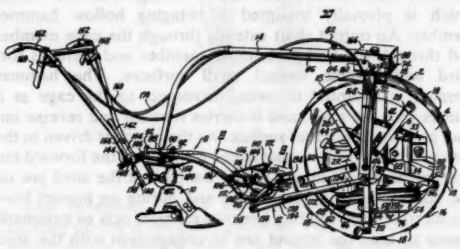
A firefighting bucket carried by a helicopter has flexible walls and a collapsible frame facilitating transportation and storage. Slide fasteners in the flexible walls may be opened to reduce the capacity of the bucket. Doors in the bottom of the bucket are operated by a fluid-operated ram which is connected to a pressurized fluid source in the aircraft. The ram may be laid flat when the frame is collapsed.

3,661,212

GARDEN TRACTOR

Fred Lee Johnson, Route 2, Box 14, New Bern, N.C.

Filed Oct. 22, 1970, Ser. No. 83,022
Int. Cl. A01b *69/00, 51/00*
U.S. Cl. 172—258 13 Claims



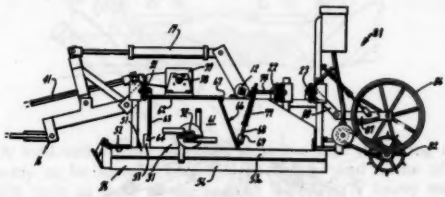
An engine and transmission assembly, within a traction wheel, is suspended by hollow trunnions on which the traction wheel is journalled. An inverted U-shaped yoke, fixed to the trunnions, straddles the wheel and combined draft, stabilizing and steering means connect the yoke to an implement frame for relative tilting about a fore-and-aft axis and for steering the wheel relative to the frame. A reaction member is universally pivoted to the top of the yoke and is connected to the implement frame. Articulated controls for the engine and transmission extend from the implement frame through the hollow trunnions.

3,661,213

AGRICULTURAL APPARATUS FOR SHAPED BEDS

Clyde L. Taylor, 1545 South Chinowith Road, Visalia, Calif.

Continuation of application Ser. No. 716,577, Mar. 27, 1968, now abandoned. This application Mar. 19, 1970, Ser. No. 19,544
Int. Cl. A01b *33/02, 33/16*
U.S. Cl. 172—72 6 Claims



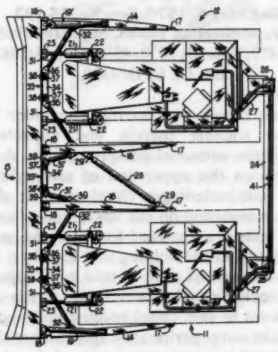
Agricultural apparatus for shaped beds having a rotatable mulcher assembly adapted to engage the top surface of the bed and to break up the top surface of the bed to form a relatively fine mulch on the top of the bed and having a housing which overlies the bed and encloses the upper extremities of the mulcher assembly, the housing having an opening to the rear and means for enclosing the opening so that all the clods on the top surface of the bed cannot exit from the housing and are broken up or pulverized by the mulching assembly.

3,661,214

SIDE-BY-SIDE TRACTOR COMBINATION

Robert A. Peterson, San Leandro, Calif.; Frank A. Grooss, Morton, Ill.; William C. Morgan, Chillicothe, Ill.; Robert N. Stedman, Chillicothe, Ill., and Max J. Teasdale, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of application Ser. No. 635,803, May 31, 1971, now abandoned. This application Dec. 7, 1970, Ser. No. 95,978
Int. Cl. E02f *3/76*
U.S. Cl. 172—801 9 Claims



Two or more tractor vehicles are disposed in a highly stable unitized side-by-side relationship to apply increased trac-

tive effort to a single working implement such as a bulldozer blade. Disengageable bracing structure couples the adjacent tractors to maintain parallelism and a pre-determined longitudinal relationship without subjecting localized regions of the assembly to excessive stress. In a preferred form, the bracing maintains these relationships while providing for independent oscillations of the tractors in response to terrain irregularities.

3,661,215

TILTING DOZER BLADE

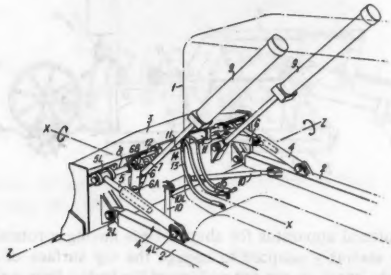
Pietro Pensa, Milan, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jan. 29, 1970, Ser. No. 6,870

Claims priority, application Italy, Feb. 4, 1969, 12423 A/69

Int. Cl. E02f *3/76*

U.S. Cl. 172—804 **5 Claims**



A bulldozer construction for a tractor comprises a dozer blade extending across the front of the tractor, a pair of strut assemblies each connected at one end to receive a thrust from the blade and to transmit it to the tractor. Each assembly includes a strut of fixed length and a sub-assembly of variable length and hydraulic actuators operable by the tractor driver without dismounting from the tractor, to vary the effective length of the two sub-assemblies in unison to give a pitching movement to the blade. The actuators are also operable to vary the effective length differentially to give a tilting movement to the blade.

3,661,216

IMPACT AIR DRIVEN TOOL

Takanobu Yamanaka, Yao, Japan, assignor to Nippon Pneumatic Manufacturing Company Limited, Osaka Prefecture, Japan

Filed May 6, 1970, Ser. No. 35,193

Claims priority, application Japan, Sept. 10, 1969, 44/86476; 44/86477; Feb. 25, 1970, 45/18877; 45/18878

Int. Cl. E21b *1/00*

U.S. Cl. 173—17 **6 Claims**

An impact air driven tool having a cylinder including a piston member slidable therein and capable of being reciprocated by the action of compressed air. A handle cap unit is mounted on the upper end of said cylinder, and a chisel holding unit including a chisel member slidably supported therein is mounted on the lower end of said cylinder. A plurality of bolts are provided for fastening said cylinder, handle cap unit and chisel holding unit together, and a nut is threaded onto one end of each of said bolts adjacent to said handle cap. A socket member is threaded to the other end of each bolt adjacent to said chisel holding unit and has a contact surface on its outer periphery engageable with a supporting surface formed in a cut-out portion of the chisel holding unit whereby the relative rotation of said socket member with respect to said supporting surface is restricted. A stopper member for each nut has a polygonal opening through which the nut extends, and a collar member covers each nut and is held by a split pin extending through the collar and the nut, so that the stopper members and collars are prevented from disengaging.

3,661,217

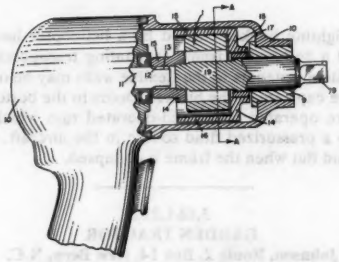
ROTARY IMPACT TOOL AND CLUTCH THEREFOR

Spencer B. Maurer, Chagrin Falls, Ohio

Continuation-in-part of application Ser. No. 852,574, Aug. 25, 1969, now abandoned. This application July 7, 1970, Ser. No. 52,826

Int. Cl. B25d *15/00*

U.S. Cl. 173—93.5 **23 Claims**



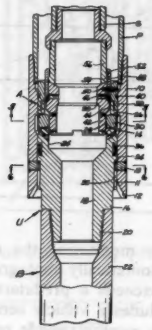
This invention pertains to a rotary impact tool and a clutch therefor, wherein a motor drives a cage member within which is pivotally mounted a swinging hollow hammer member. An output shaft extends through the cage member and through the hollow hammer member and includes forward and reverse impact anvil surfaces. The hammer member is mounted to swing in respect to the cage as it rotates with the cage, and it carries forward and reverse impact jaws on its internal surface. As the clutch is driven in the forward direction by an air motor or the like, the forward impact jaw is moved in and out of the path of the anvil jaw on the output shaft by cam action and during an impact blow the inertia of the rotating hammer member acts as automatic means to hold the impact jaw in engagement with the anvil jaw. A second embodiment includes a pair of hammers arranged to simultaneously strike a pair of anvil jaws on the anvil.

3,661,218

DRILLING UNIT FOR ROTARY DRILLING OF WELLS

Cicero C. Brown, 5429 Sturbridge Dr., Houston, Tex.

Filed May 21, 1970, Ser. No. 39,226
Int. Cl. E21b 3/12
U.S. Cl. 175—107 6 Claims



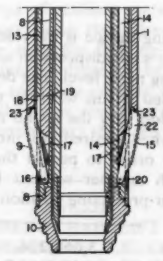
A drilling unit for rotary drilling of wells using casing as the drill string. The drilling unit is a self-contained assembly designed to be bodily inserted and withdrawn through the bore of a well casing string and comprises releasable latch means for non-rotatively locking the structure to the casing; a rotary power unit supported by the latch means and rotatively connected to a bit assembly. The latter comprises a main or pilot bit and a plurality of radially extendible and retractable underreamers actuated by fluid pressure which may first be employed for driving the power unit.

3,661,219

DRILLING SYSTEM

Yasushi Okuyama; Sho Takano, both of Tokyo, and Ryokuya Suzuki, Nihama, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed June 9, 1970, Ser. No. 44,731
Claims priority, application Japan, June 27, 1969, 44/50423
Int. Cl. F21b 9/26
U.S. Cl. 175—260 6 Claims



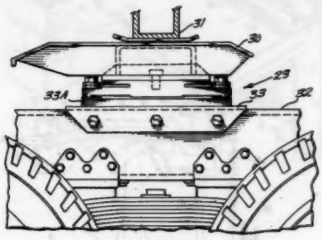
This invention relates to a drilling system wherein a latching device is integrally provided with a bit and a reaming device and is engaged with a drill stem so that the rotating force and propelling force of the drill stem may be transmitted directly to the bit and blades of the remaining device from the lower end of the drill stem.

3,661,220

WEIGHING DEVICE FOR LOGGING TRUCKS OR THE LIKE

Carl R. Harris, Kirkland, Wash., assignor to Electro Development Corporation, Lynnwood, Wash.

Filed Nov. 1, 1971, Ser. No. 194,273
Int. Cl. G01g 19/08
U.S. Cl. 177—136 7 Claims



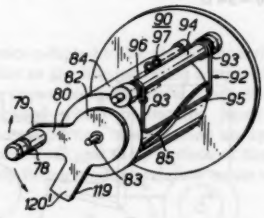
A load cell system including a strain gage mounting assembly to be located between the bolster and frame of a truck such as used in the logging industry. A heavy steel block having longitudinal slots cut therein is secured to the bolster to transmit forces to the frame in a manner such that a sensing beam is created. Sensing devices secured to the assembly respond to stresses of the beam to provide force indications to an indicator which shows the weight of the load on the truck.

3,661,221

WEIGHING APPARATUS

Edward George Barrett, Witney, England, assignor to Smiths Industries Limited, London, England

Filed July 15, 1970, Ser. No. 54,940
Int. Cl. G01g 19/08, 3/14
U.S. Cl. 177—137 11 Claims



Weighing apparatus incorporated in a vehicle to be responsive to the load on the vehicle's axle(s) and to be used when the vehicle is in motion, which comprises mechanical low pass filtering means to attenuate sudden variations of the relative displacement between the vehicle's load carrying structure and axle(s) at least when the moving vehicle is heavily laden so that only the average value of this varying relative displacement is utilized in giving an indication of the load carried by said structure.

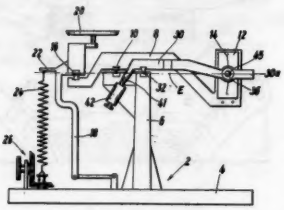
The mechanical low pass filtering means comprises high rate spring means and mechanical damping means that have two closely spaced generally concentric cylindrical surfaces defining an annular gap which contains a silicone substance in fluid or compound form.

3,661,222

BEAM BALANCE WITH A TARE SPRING AND A DEVICE FOR COMPENSATION OF LEVELLING ERRORS

Ludwig Weickhardt, Bovenden, Germany, assignor to Sartorius-Werke GmbH (und Vormals Gottinger Prazisionswaagenfabrik GmbH), Gottingen, Germany

Filed Feb. 5, 1971, Ser. No. 112,883
Claims priority, application Germany, Mar. 13, 1970, P 20 11 912.4
Int. Cl. G01g *23/32*
U.S. Cl. 177—178 2 Claims



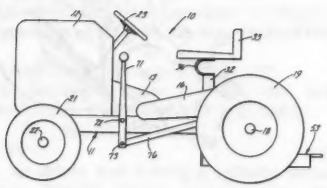
A beam balance has a tare spring acting upon a beam upon which is mounted a microscale a section of which can be projected on a screen by a projecting device whose lens is mounted on a pendulum arm. The pendulum arm has an effective length less than that of the beam arm and is pivotable about an axis located outside of the beam axis and parallel thereto. The beam balance has a device for the compensation of levelling errors. The effective length of the pendulum arm and the position of its supporting axis are such that any tipping of the balance stand about an axis parallel to the beam supporting axis brings about equal displacement of the entire pendulum and microscale screen in directions parallel to each other.

3,661,223

TRACTOR FRAME STRUCTURE

John C. Jensen, 559 Monroe Blvd., South Haven, Mich.

Filed Dec. 5, 1969, Ser. No. 882,550
Int. Cl. B60k *9/00*; B60d *1/00*
U.S. Cl. 180—54 D 8 Claims



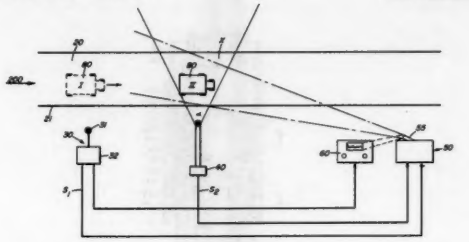
A tractor and, in particular, a tractor having an improved frame structure for permitting same to be easily assembled and maintained by nonskilled personnel. The frame structure comprises a rectangular frame having an upwardly extending seat support member, the lower ends of the seat support member having a draw bar device pivotally mounted thereon. The tractor is provided with a rear axle housing which has a pair of substantially parallel bracket plates fixedly secured thereto, which bracket plates are releasably connected to the rearward end of the rectangular frame.

3,661,224

NOISE MONITORING APPARATUS

Richard G. Allen, Pound Ridge, N.Y.; Benjamin B. Bauer, Stamford, and Emil L. Torick, Darien, both of Conn., assignors to Columbia Broadcasting System, Inc.

Filed Sept. 14, 1970, Ser. No. 71,729
Int. Cl. G08g *1/10*
U.S. Cl. 181—0.5 AP 12 Claims



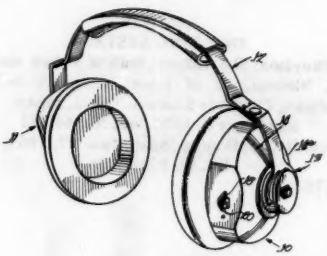
An apparatus for monitoring the noise level of passing vehicles and for automatically photographing a vehicle which emits noise that exceeds a predetermined threshold level. The apparatus includes a vehicle sensor which acoustically determines when a passing vehicle reaches a chosen target area. In a preferred embodiment of the invention the vehicle sensor includes a pair of microphones and an acoustic delay line which feeds one of the microphones. The microphone outputs are correlated to determine when the vehicle enters the target area.

3,661,225

EAR-PROTECTING DEVICE

Marshall N. Anderson, Grayslake, Ill., assignor to Sellstrom Manufacturing Company, Palatine, Ill.

Filed Aug. 26, 1970, Ser. No. 66,926
Int. Cl. G10k *11/04*; A61f *11/02*
U.S. Cl. 181—33 R 8 Claims



An ear-protecting device is provided which is adapted to protect the wearer when disposed in an environment having a high and disturbing noise level. The device is provided with a manually controlled means whereby the wearer may with a simple manipulation vary the sound resistant characteristics of the device, when desired, to provide comfort for the wearer and/or in order to permit the wearer to engage in conversation with another without having to remove the device from its ear-protecting position.

3,661,226

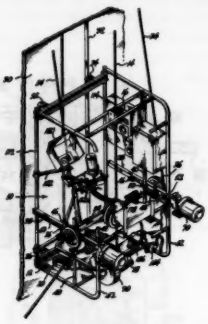
SUSPENDED STAGING HOLD-IN APPARATUS

Sidney L. Fisher, Renton, Wash., assignor to Spider Staging, Inc., Seattle, Wash.

Original application Sept. 29, 1969, Ser. No. 861,757.
Divided and this application Dec. 10, 1970, Ser. No. 96,912
Int. Cl. E04g *3/10*
U.S. Cl. 182—142 6 Claims

One or more tensioned hold-in lines hold the staging inwardly against the object on which welding work is being

done. Each hold-in line rides on a sheave which is automatically controlled to move either towards or away from the object for the purpose of maintaining proper tension in the hold-in line.

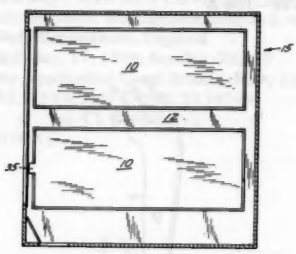


3,661,227

DRAINAGE COLLECTION CONTAINER

Raymond B. Robel, Candy Cove Road, and Richard M. Walsh, Route 3, Box 270 Red Oak Hill, both of Prior Lake, Minn.

Filed Jan. 12, 1970, Ser. No. 2,025
Int. Cl. F16n *31/00*; B65d *5/22*
U.S. Cl. 184—106 **7 Claims**



A drainage collection container formed by a sheet of foldable material having flap extensions along the side edges thereof and dimensions greater than the dimensions of a vehicle with which it is to be used. The flap extensions wrap around elongated strips of resilient material to form curbs and seal the container along the sides and corners with means in one of the sides for forming a discharge spout therefrom. The container is adapted to be driven over by the vehicle and the sides are made resilient to compress as the vehicle passes over the same and return to the container shape and collect drainage from the vehicle when positioned thereon.

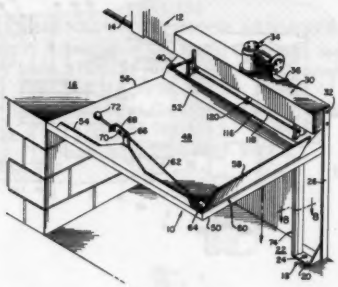
3,661,228

WHEEL CHAIR LIFT

Jay L. Glasser, 2305 Martha Ave., N.E., Canton, Ohio

Filed Dec. 23, 1969, Ser. No. 887,583
Int. Cl. B66b *11/04*
U.S. Cl. 187—25 **10 Claims**

A vertical wheelchair lift including a vertically movable horizontal platform having edge wheel curbs to prevent wheelchair dislodgement therefrom one of the curbs constituting a loading and unloading ramp selectively adjustable to a lowered wheelchair loading and unloading position and a raised curb position, and means on said lift selectively operable for raising and lowering the ramp, and for vertical movement of the platform. Operating control means are so located as preferably to be operable by a wheelchair occupant, but readily accessible for external use. The lift is ideally suited for use in conjunction with structures having entrance or other steps between levels which are not normally negotiable solely by a wheelchair user.

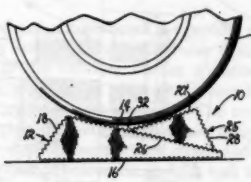


3,661,229

LEVELING DEVICE

James H. Stonhaus, 919 E. Holland, Fresno, Calif.

Filed Nov. 9, 1970, Ser. No. 87,917
Int. Cl. B60t *3/00*
U.S. Cl. 188—32 **9 Claims**



A leveling device adapted to be placed beneath the wheels of a camper trailer or the like providing a tapered supporting block having an upper, inclined, wheel supporting ramp surface and a tapered wheel positioning block adjustably mounted on said supporting block having an upper surface oppositely inclined from said ramp surface of the supporting block in angularly facing cradling relation to the wheel of the trailer.

3,661,230

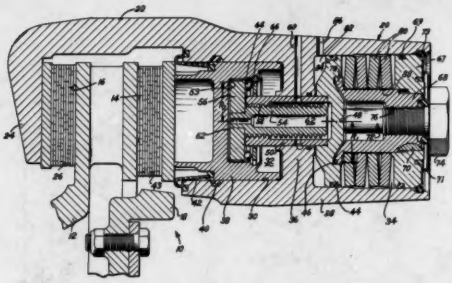
DISC BRAKE WITH ACTUATING MEANS AND MANUALLY RELEASABLE ADJUSTING MEANS

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation

Filed May 18, 1970, Ser. No. 38,459
Int. Cl. F16d *65/56*
U.S. Cl. 188—71.9 **9 Claims**

A disc brake is disclosed which has a spring actuator in addition to the usual hydraulic actuator. When the brake is functioning normally, fluid pressure opposes the spring actuator to permit normal hydraulic operation of the brake. However, when a malfunction in the vehicle's hydraulic system prevents operation of the hydraulic actuator, the spring actuator automatically applies the brake to immobilize

the vehicle. A mechanical release mechanism for the spring actuator is provided so that the vehicle may be moved if the

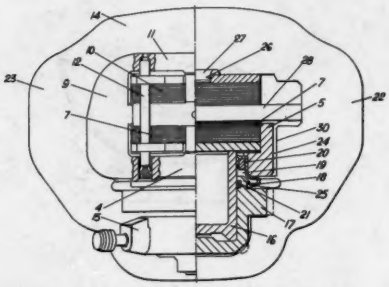


spring actuator applies the brake in an inconvenient location. The spring actuator may also be used as a parking brake.

3,661,231
SPOT-TYPE DISC BRAKE

Hans Albert Beller, Bad Vilbel, and Jochen Burgdorf, Offenbach, M., both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed July 13, 1970, Ser. No. 54,178
Claims priority, application Germany, July 24, 1969, P 19 37 555.4
Int. Cl. F16d *55/18*
U.S. Cl. 188—72.4 **9 Claims**



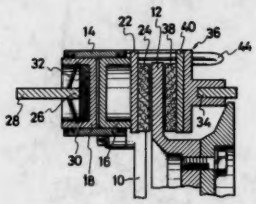
A floating spot-type disc brake for vehicles having a fixed carrier extending over the edge of the disc, brake shoes slidably mounted on each side of the carrier and a hydraulic actuator on one side of the disc with a frame for transmitting the actuating force to the brake shoe on the other side of the disc, the actuator being supported by a bore in the carrier in which the front of the piston is slidable. The frame is supported on one side by the actuator housing and on the other side by the brake shoes.

3,661,232
SPOT TYPE DISK BRAKE

Toshio Kondo, Hekikai, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Aich Pref., Japan

Filed Mar. 24, 1970, Ser. No. 22,331
Claims priority, application Japan, Mar. 29, 1969, 44/26844
Int. Cl. F16d *65/20*
U.S. Cl. 188—73.4 **4 Claims**

A spot type disk brake for wheels comprising a rotatable disk, two friction linings and backing plates secured thereto on mutually opposite flat sides of the disk, one of which is located between one of two pistons slidably fitted in a cylinder and the disk, two parallel pins for supporting the friction linings and backing plates, a reaction transfer plate engaged with the other piston and with a support member

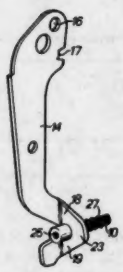


which abuts back to back the other backing plate whereby the worn out linings with the backing plates may be easily detached from the brake mechanism after removing the pins.

3,661,233
INTERNAL SHOE DRUM BRAKES

Hugh Grenville Margetts, and Gordon Alfred Habgood, both of Warwickshire, England, assignors to Girling Limited, Birmingham, England

Filed Feb. 24, 1970, Ser. No. 13,597
Claims priority, application Great Britain, Mar. 1, 1969, 11033/69; Dec. 12, 1969, 60631/69
Int. Cl. F16d *65/22*
U.S. Cl. 188—106 A **13 Claims**



A mechanical actuator for separating adjacent ends of shoes of a shoe-drum brake includes an angularly movable lever pivotally connected to one of the shoes. The lever is constructed from a blank having a body portion of substantial length which is formed at one end with an outwardly extending lug. The lug and an adjacent part of the body portion are provided with an opening having portions of different dimensions to permit the insertion and retention therein of a boss at the free end of a brake applying member for which at least a part of the lug forms an abutment.

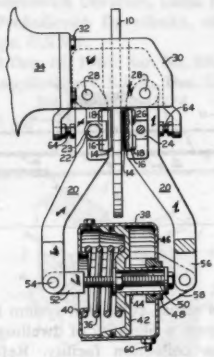
3,661,234
DISC BRAKE

Herbert Moederndorfer, and George E. Schubert, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 22, 1969, Ser. No. 826,802
Int. Cl. F16d *65/24*
U.S. Cl. 188—170 **4 Claims**

A disc brake of the type in which friction pads or small friction surfaces are carried on opposite sides of the disc

which rotates with a vehicle wheel or other rotatable part of the vehicle. The friction pads are spring urged into contact

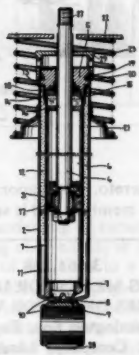


with the disc to retard or stop the vehicle and are normally held out of contact with the disc by fluid pressure.

3,661,235
BRAKE DISC AND HUB COMBINATION
Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed Mar. 17, 1970, Ser. No. 20,359
Claims priority, application Great Britain, Mar. 22, 1969, 15,173/69; July 4, 1969, 33,747/69
Int. Cl. F16d *65/12*
U.S. Cl. 188—218 XL **9 Claims**

A brake disc for use in a disc brake and a method of manufacture thereof is characterized in that the bell and annulus are separately manufactured with complementary abutting datum surfaces and are engaged together by projections on one which mesh in slots to hold the two members together against relative axial and rotational movement. Preferably the projections engage the sides of the slots and not the roots so that there is some rotational preloading. The projections can be provided on a continuous or discontinuous skirt integral or welded to the bell and the slots are on a surface of the annulus opposite to the datum face thereof. The projections may be partially sheared from a continuous skirt.

3,661,236
HYDROPNEUMATIC SHOCK ABSORBER
Felix Wossner, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany
Filed Mar. 10, 1970, Ser. No. 18,229
Claims priority, application Germany, Mar. 13, 1969, P 19 12 781.2
Int. Cl. F16f *9/06, 9/34, 9/40*
U.S. Cl. 188—315 **8 Claims**

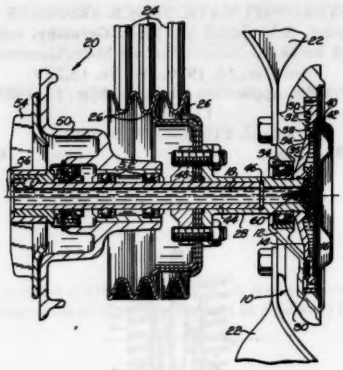


The cylinder of a shock absorber is spacedly enveloped by a coaxial, axially substantially coextensive cylindrical outer shell. A piston in the cylinder carries a piston rod which passes in sealing engagement through an annular first axial end wall of the cylinder and the shell. The cylinder cavity and the annular chamber between shell and cylinder are connected near the second imperforate axial end wall of the shock absorber which is below the annular wall in the normal operating position. A resilient sleeve in the chamber seals the cylinder to the first end wall and serves as a check valve on bore, in the cylinder for radially outward flow of gas. A compressed gas cushion occupies the upper portion of the chamber. The remainder of the chamber, the cylinder cavity, and axial throttling passages in the piston are filled with liquid. Gas reaching the cylinder cavity is quickly returned to the chamber through the check valve during operation of the shock absorber.

3,661,237
WATER-COOLED VISCOUS COUPLING
Owen R. Thompson, Lexington, Ky., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 19, 1969, Ser. No. 878,136
Int. Cl. F16d *35/00, 13/72*
U.S. Cl. 192—58 B **11 Claims**

A viscous coupling includes an input and an output member which define a shear space therebetween. Viscous fluid in the shear space operates to transmit torque between the input and output members. When torque is transmitted between the input and output members, heat is generated. One of the members has a cooling medium chamber to receive a cooling medium from a cooling medium conduit. The conduit is positioned substantially in alignment with the rotational axis of the input and output members. The cooling

medium gravitates toward the outer peripheral surfaces of the cooling medium chamber and vaporizes upon application



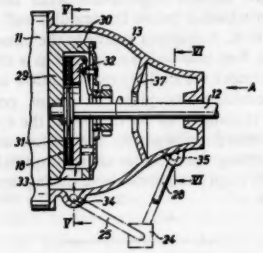
of sufficient heat thereto. The vapor gravitates toward the rotational axis of the members and is subsequently cooled.

3,661,238

HEAT DISSIPATING MEANS FOR USE WITH FRICTION CLUTCHES OF MOTOR VEHICLES

David A. Davies, Leamington Spa, England, assignor to Automotive Products Company, Limited, Leamington Spa, Warwickshire, England

Filed Oct. 30, 1969, Ser. No. 873,770
Claims priority, application Great Britain, Oct. 30, 1968, 51,474/68
Int. Cl. F16d *13/72*
U.S. Cl. 192—113 A **6 Claims**



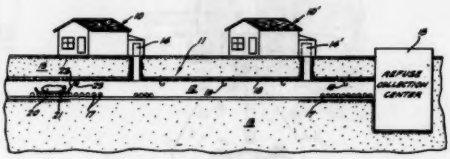
A motor vehicle (10) has a friction clutch (18) housed within a chamber defined in part by a bell housing (13). A hollow casing (24) is mounted below the bell housing (13) with its interior in communication with the interior of the bell housing (13) through two conduits (25 and 28) which each terminate in a corresponding one of two ports (26 and 27) which are spaced apart axially of the bell housing (13). In operation of the motor vehicle (10) air heated by operation of the clutch (18) flows from the high pressure region (22) at the radial periphery of the clutch (18) through the hollow casing (24) to the low pressure region (23) at the other end of the bell housing (13) and is cooled by heat exchange within the hollow casing with the relative air stream caused by movement of the vehicle (10).

3,661,239

UNDERGROUND REFUSE COLLECTION SYSTEM

Robert J. Freeman, 1049 North Highland, Fullerton, Calif.

Filed Sept. 9, 1970, Ser. No. 70,670
Int. Cl. B65g *47/00*
U.S. Cl. 198—20 **3 Claims**



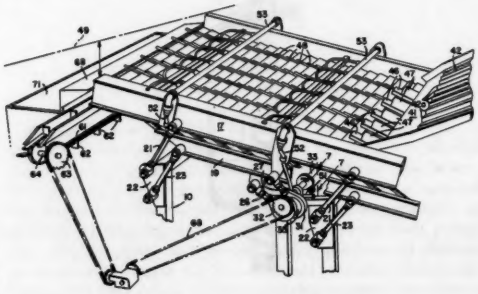
An underground refuse collection system including a tunnel extending beneath a plurality of dwellings and terminating at a common collection facility. Refuse from each dwelling is lowered to the tunnel, wherein appropriate conveyor means transports the refuse to the collection center. In a preferred embodiment, the refuse is placed on a reusable tray having a detachable connector associated therewith. The tray is lowered down a shaft to the tunnel, wherein a driven endless belt catches the detachable connector and pulls the refuse on the tray to the collection center.

3,661,240

SHUFFLE FEED MECHANISM

Poul H. Baumann, San Jose, Calif., assignor to Genevieve I. Hanscom (formerly Genevieve I. Magnuson) and Genevieve I. Hanscom, Robert Magnuson, Louis J. Thomson (formerly Louis J. Duggan), as trustees of the estate of Roy M. Magnuson part interest to each

Filed Jan. 19, 1970, Ser. No. 3,875
Int. Cl. B65g *25/04*
U.S. Cl. 198—33 R **4 Claims**



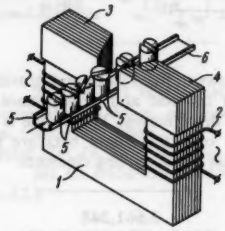
A shuffle feed mechanism for elongated articles such as bread sticks wherein a conventional shuffle feed mechanism is provided with a series of lanes defined by elements projecting from the article advancing faces of the shuffle feed members and is mounted in inclined relation one side to the other. A fluid operated realigning mechanism is provided for aligning articles which are being fed with their length disposed parallel to the length of the shuffle feed mechanism to pivot these articles around until they are arranged at right angles to the direction of feed.

3,661,241

APPARATUS FOR THE SIMULTANEOUS CONTACTLESS SEPARATION OF INDIVIDUAL NON-MAGNETIC ELECTRICALLY CONDUCTIVE BODIES FROM A CONTINUOUS FLOW AND ORIENTATION THEREOF

Benyamin Alexandrovich Ioffe, ulitsa Raunas, 45/2, kv. 81; Vyacheslav Semenovich Dorofeev, ulitsa Frunzes, II, kv. 5, and Eduard Prokofievich Davydenko, ulitsa Lenina, 136, kv. 5, all of Riga, U.S.S.R.

Filed Dec. 16, 1969, Ser. No. 885,537
Claims priority, application U.S.S.R., Dec. 25, 1968, 1289053
Int. Cl. B68g 47/24
U.S. Cl. 198—33 AB 6 Claims



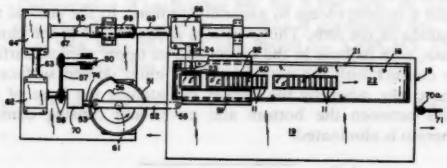
An apparatus for orientation electrically conductive bodies, preferably, non-magnetic ones, in a magnetic field, comprising an electromagnet connected with a source of alternating current, the pole pieces of this electromagnet defining therebetween a zone where the successively fed bodies are oriented, this apparatus providing for contactless separation of the successive ones of these bodies from the continuous stream in which they are fed toward the orientation zone, this apparatus further providing for selectively either grouping these successive bodies into a continuous stream, after they have passed this orientation zone, or spacing them after they have passed that zone; this invention being particularly suitable for the aims of introducing automation into such operations, when diverse objects are to be fed into all kinds of processing equipment.

3,661,242

PACKAGING APPARATUS

David Clancy, Canaan, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 28, 1970, Ser. No. 41,306
Int. Cl. B65g 47/26
U.S. Cl. 198—34 18 Claims



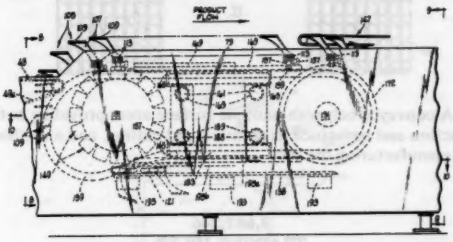
Envelope-type packages are detached from a packaging machine and deposited in overlapped relation in longitudinally distinct groups each containing the same number of packages on a continuously moving conveyor belt. Group separation is accomplished by periodic cam actuated displacement of the conveyor belt so that a package deposited upon the belt after a group of a predetermined number have been deposited in overlap will lie on the belt in definite spacial relation to that group and will be the leading package of the next group. The cam speed may be varied to select the number of packages in a group.

3,661,243

CONVEYOR SYSTEM

Robert J. Piatek, Prospect, Ill., assignor to Kraftco Corporation, Chicago, Ill.

Original application Feb. 23, 1967, Ser. No. 621,095, now Patent No. 3,479,024, dated Nov. 18, 1969. Divided and this application Nov. 17, 1969, Ser. No. 877,110
Int. Cl. B65g 47/26
U.S. Cl. 198—34 4 Claims



An apparatus for transferring a plurality of individual units from a conveyor having one velocity in a given direction and changing the velocity of the units to a second value in the same direction. The units are engaged individually by elements of a second conveyor having a velocity component in the given direction the same as that of the units at the time of engagement of the elements with the units.

3,661,244

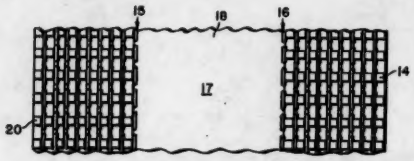
AUTOMATIC CIRCULAR WINDING AND RELEASING BELT CONVEYOR

Masaaki Koyama, No. 2265-20, Kawashimacho, Hodogaya-ku, Yokohama, Japan

Filed Apr. 18, 1969, Ser. No. 817,388
Claims priority, application Japan, June 28, 1968, 43/44683
Int. Cl. B65g 15/08
U.S. Cl. 198—184 1 Claim

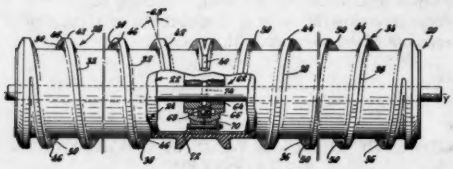
A belt conveyor or the like carries the object to be forwarded on the belt surface by means of a mechanically operated pulley provided with an electric motor as a motive power. The belt conveyor prevents scattering of lightweight powder or grains due to wind at the time of their conveyance, and at the same time, it prevents water leakage due to rain and snow, and also enables a steep slope conveyance as well as an entirely new and progressive plane detour wherein the belt automatically takes the form of a cylinder as to envelop the object to be carried.

3,661,245
ABRASION-RESISTANT CONVEYOR BELT
Edward K. Mol, Grand Rapids, and Marvin D. Stahl, Belmont, both of Mich., assignors to A. J. Sparks & Company, Grand Rapids, Mich.
Filed June 18, 1969, Ser. No. 834,418
Int. Cl. B65g 15/30
U.S. Cl. 198—193 5 Claims



A conveyor belt with multiple surface areas providing both traction and resistance to abrasion and cutting, and a method of manufacturing the belt.

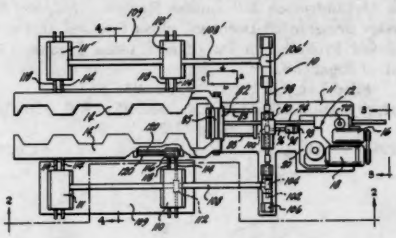
3,661,246
TRAINING IDLER
Stuart F. Faunce, 169 Paterson Road, Fanwood, N.J.; William E. Stout, 40 Brookside Avenue, Hawthorne, N.J., and Harold W. Koehler, 7 Grandview Drive, West Paterson, N.J., assignors to Hewitt-Robins Inc., Stamford, Conn.
Filed Mar. 26, 1970, Ser. No. 22,985
Int. Cl. B65g 15/62
U.S. Cl. 198—202 8 Claims



A skewing, rigid urethane spiral training idler and method of forming the same wherein the idler has right and left hand threads with continuous helical lands extending from the ends of the roll to the center of the roll where the threads merge and terminate. The training idler is pivotally mounted on a bearing in such a manner that the idler automatically skews to produce a training effect when a belt starts to detrain. For any longitudinal cross-sectional normal to a first plane that includes the longitudinal centerline of the idler, the sidewalls of the threads are substantially normal to the plane with a sight positive draft and as a result of this configuration the roots of the threads are offset with respect to each other at this plane even though the thread lands are continuous spirals. The idler roll is cast by injecting urethane compound between a pair of mold sections having their parting line coincident with the plane and an internal steel tube coated with a bonding agent. Due to the unique thread configuration relative to the mold parting line, the mold halfs are readily separated from the idler once the initial curing operation is completed even though the idler has the left-and right-hand threads thereon.

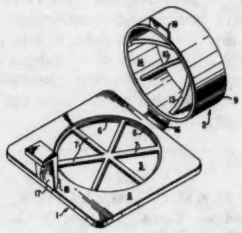
3,661,247
TRANSFER DEVICE
Bernard J. Wallis, 25200 Trowbridge Avenue, Dearborn, Mich.
Filed Aug. 28, 1970, Ser. No. 67,908
Int. Cl. B65g 25/04
U.S. Cl. 198—218 22 Claims

A transfer device for indexing work-pieces between stations in a press-mounted die having longitudinally and laterally reciprocating workpiece-engaging finger bars. The drive means for both longitudinal and lateral motions comprises a single cam track engaging two cam followers. The longitudinal stroke is accurately maintained by reciprocating



a shiftable rod between fixed stops and providing a yieldable member between the rod and drive means for absorbing overtravel of the drive means. The device is so constructed that substantially only the finger bars are shifted thereby reducing the inertia of the moving elements.

3,661,248
CONTACT LENS CASE
Allan A. Isen, and Fredric M. Kirchner, both of Buffalo, N.Y., assignors to Griffin Laboratories Inc., Buffalo, N.Y.
Filed Oct. 19, 1970, Ser. No. 81,855
Int. Cl. A45c 11/00; B65d 85/54
U.S. Cl. 206—5 A 3 Claims

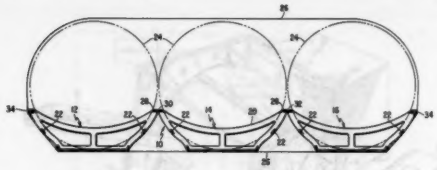


A case for storing a contact lens, particularly a semi-scleral type lens, comprises a bottom and a cover hinged thereto. The bottom has a recess or depression formed therein to receive the base of the contact lens. The cover is provided with a domed recess to generally conform to the conical top surface of the lens. Thus, the lens is positioned in the closed case, with its base in the recess and its upper conical surface in contact with the complementary inner domed surface of the cover, whereby the danger of catching the base of the lens between the bottom and cover and causing damage thereto is eliminated.

3,661,249
PACKAGING ARRANGEMENT
Philip M. Clemens, 1835 Pemberton Drive, Fort Wayne, Ind.
Filed Jan. 5, 1970, Ser. No. 736
Int. Cl. B65d 65/16
U.S. Cl. 206—45.33 8 Claims

The specification discloses a packaging arrangement especially adapted for use with food products, such as cookies or donuts, biscuits, rolls, candy, or the like. The packaging arrangement comprises a tray made up of portions which can be broken apart and with each portion adapted to receive and support respective articles. A sleeve like wrapper is pro-

vided for the tray and the tray may have serrations formed on one end to facilitate tearing the wrapper open at a desired

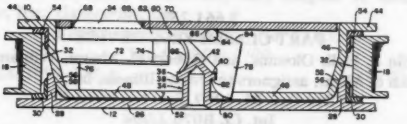


place so the tray can be slid endwise from the wrapper and, if desired, returned thereto.

3,661,250
REEL CASE WITH LOCK

George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed May 28, 1970, Ser. No. 41,222
Int. Cl. B65d *45/00, 85/67*
U.S. Cl. 206—52 F **13 Claims**

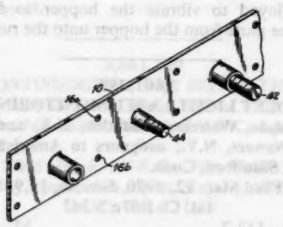


This disclosure relates to improvements in cases for tape reels and the like. In particular, the improvements relate to a simplified construction of a lock to secure the separable halves of a tape reel case together. The lock includes only a single moving part which is located within a handle formed centrally within one of the halves of the case. The moving art of the lock cooperates with an upstanding post formed integrally with the other half of the reel case to lock the halves of the case together. The moving part of the lock also includes a release button which is exposed through the handle in the case and is disposed on the handle to facilitate gripping of the handle and operation of the release button.

3,661,251
STRIP OF FASTENERS IN A PREDETERMINED SEQUENCE

Ronald Waeltz, Hatboro, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation of application Ser. No. 8,106, Jan. 20, 1970, now abandoned , which is a division of application Ser. No. 641,754, May 29, 1967, now Patent No. 3,495,315. This application Apr. 22, 1971, Ser. No. 136,589
Int. Cl. B65d *83/00*
U.S. Cl. 206—56 DF **6 Claims**

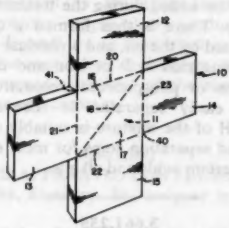


Equipment for setting fasteners in a tape or strip of flexible and resilient material from which the fasteners may be automatically inserted into workpieces. The fasteners are carried in holes in the tape which are formed to accommodate different types or size fasteners. In addition, these holes may be barrelled to enhance the alignment of the fasteners for their insertion into the workpieces.

3,661,252
PROTECTION OF ARTICLES IN TRANSIT

Philipp J. Weichberger, 463 West St., New York, N.Y.

Filed June 16, 1970, Ser. No. 46,786
Int. Cl. B65d *85/46*
U.S. Cl. 206—62 R **5 Claims**

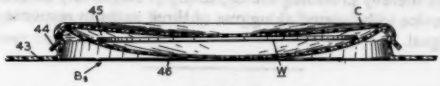


A device for protecting rectangular panels in transit includes a resilient sheet of substantial thickness having a substantially square central portion and four peripheral portions secured to the respective marginal edges of the central portion. In operation, the central portion is folded diagonally against itself so that pairs of adjacent peripheral portions overlie each other. The folded portion of the sheet is placed between two aligned panels at the corners and the respective pairs of coplanar peripheral portions are folded sequentially over the adjacent panel and secured to each other against the outwardly facing panel surface, the respective panels being maintained apart and the panel corners being protected.

3,661,253
RETAINING TRAYS FOR SEMICONDUCTOR WAFERS AND THE LIKE

Paul W. Cronkhite, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 764,472, Oct. 2, 1968, now Patent No. 3,482,682, which is a continuation-in-part of application Ser. No. 644,966, June 9, 1967, now abandoned. This application Dec. 4, 1969, Ser. No. 882,179
Int. Cl. B65d *81/00, 85/30*
U.S. Cl. 206—65 R **10 Claims**



A series of marginally registrable plastic trays having a plurality of wells for accommodating semiconductor wafers and similar elements. The retaining wells are provided with a wall having a surface configuration such that the critical surface of the wafer does not contact the well. A removable cap is disposed over each of the retaining wells and is provided with means for engaging the upwardly presented surface of the semiconductor wafer. Each of the trays is registrable with like trays so that a series of these trays can be stacked, wrapped, and shipped as a unit.

3,661,254

PROCESS FOR SEPARATION OF SILICEOUS AND PHOSPHATIC MATERIAL FROM IRON ORE

Aurelio F. Sirianni, and Ira E. Puddington, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Apr. 28, 1969, Ser. No. 819,600
Claims priority, application Canada, June 7, 1968, 022,002
Int. Cl. B03d *3/06*
U.S. Cl. 209—5 3 Claims

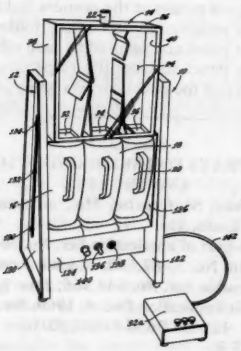
Siliceous and phosphatic material is separated from iron ore by subjecting a finely ground body of such ore in aqueous suspension to treatment with a conditioning agent which causes selective species in the ore body to become hydrophobic, and a hydrocarbon oil is employed with agitation to cause preferential agglomeration of the hydrophobic particles. Water may be added during the treatment to decrease the pulp density. There is thus formed a densely packed phase agglomerated by the oil, and a residual aqueous phase, the oil phase being rich in P or iron and the other phase being rich in iron or phosphorous, respectively. These agglomerates are easily separated to recover the desired products. The pH of the mixture is suitably adjusted during the treatment and separation steps for most effective results by additions of certain acids and alkalis.

3,661,255

SORTING APPARATUS

John E. Toth, San Diego, Calif., assignor to Delta Design, Inc., La Mesa, Calif.

Filed Feb. 2, 1970, Ser. No. 7,534
Int. Cl. B07c *3/02*
U.S. Cl. 209—74 5 Claims



A sorting apparatus having a support structure, three containers, and a sorting mechanism. The sorting mechanism comprises two rotatable partitions as well as three fixed partitions thereby providing the capability of selectively directing a device to be sorted along one of three paths in response to a signal.

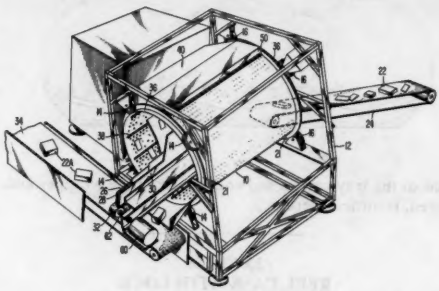
3,661,256

MAIL HANDLING AND SEPARATING APPARATUS

Eugene T. Hain, St. Davids, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1970, Ser. No. 35,086
Int. Cl. B07c *5/20*
U.S. Cl. 209—74 4 Claims

An automatic vacuum culling apparatus for separating relatively large, bulky items from relatively thin, flat, lightweight items in which a vacuum is created through perforations along a portion of the side wall of a tilted, rotating drum. Lightweight, relatively flat items are attracted by suction against the side wall of the drum and are rotated to the top thereof where the vacuum terminates. These items then drop into a chute which funnels the items to a conveyor for transportation outwardly away from the culler. Heavyweight



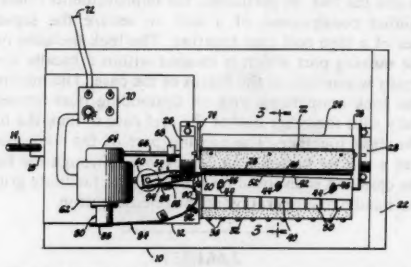
and relatively bulky items, being too large to be adhered by suction against the side wall of the rotating drum, tumble out the lower end of the tilted drum onto a second conveyor belt for transportation away from the culler.

3,661,257

PART CLASSIFYING DEVICE

Maclin S. Hall, Okemos, and Robert H. Moore, Williamston, both of Mich., assignors to Owens-Illinois, Inc.

Filed Oct. 24, 1969, Ser. No. 869,190
Int. Cl. B07b *13/04*
U.S. Cl. 209—101 10 Claims



A device for classifying parts according to size by utilizing a motor rotated cylinder and a gauge blade, which is adjustable positioned relative to the periphery of the cylinder to form an open runway that progressively increases in size. A hopper with the parts to be classified, discharges the parts unto the runway and gravity and the rotating cylinder combine to cause the parts to move along the runway. When a part reaches an opening of a size corresponding to the part size, the part drops down into a bin which collects and stores all parts of this size. The same motor that rotates the cylinder is also employed to vibrate the hopper to facilitate the transfer of the parts from the hopper unto the runway.

3,661,258

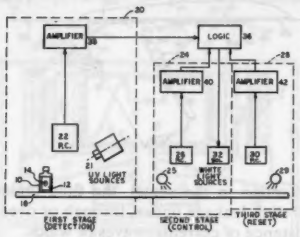
ULTRAVIOLET LIGHT LABEL MONITORING SYSTEM

Michael Madalo, Whitehouse Station, N.J., and William H. Marlow, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 12, 1970, Ser. No. 18,945
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.7 5 Claims

A three-stage ultraviolet light label detection unit is provided for monitoring articles to detect and separate articles

having luminescent, i.e., fluorescent or phosphorescent, imprints located thereon. The first detection stage uses ultraviolet light to sense the presence of luminescent imprints; the second control stage uses white light sensing to control



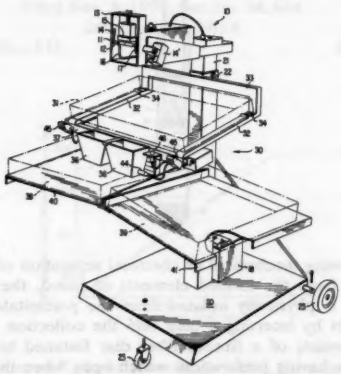
the movement of articles passing thereby; the third reset stage also uses white light sensing to reset the control stage. Each stage acts through a logic circuit adapted to provide the desired detection and separation of luminescent from non-luminescent articles.

3,661,259

CHICK SORTING AND COUNTING APPARATUS

Lamar W. Reynolds, Gainesville, Ga., assignor to Beak-O-Vac, Inc., Gainesville, Ga.

Filed June 17, 1970, Ser. No. 47,032
Int. Cl. B07c *7/00*
U.S. Cl. 209—123 **3 Claims**



Apparatus for supporting a chicken vaccination device and for facilitating a sorting of the male and female baby chicks into separate trays subsequent to the vaccination thereof, which additionally provides a system for counting the chick as they are deposited into each of the respective trays and actuating an alarm device for indicating to the operator or vaccine administrator that a tray contains a pre-determined number of chicks and accordingly, that a new tray must be substituted therefor.

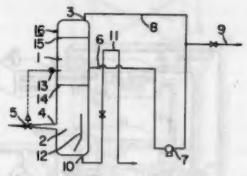
3,661,260

CONTINUOUS SLURRY SEPARATION

Michio Koga, and Kiyobumi Ando, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

Filed May 6, 1970, Ser. No. 35,100
Claims priority, application Japan, May 14, 1969, 44/36579
Int. Cl. B01d *21/10*
U.S. Cl. 210—74 **8 Claims**

A mixture of an oil slurry phase and an aqueous phase is continuously supplied into a tower constituting a separation chamber and is retained in it for a time to stratify into respective upper and lower layers, from which the slurry and aqueous phase, respectively, are continuously drawn off and a portion of the drawn-off slurry is tapped and continuously discharged as a slurry product, while the remainder is con-



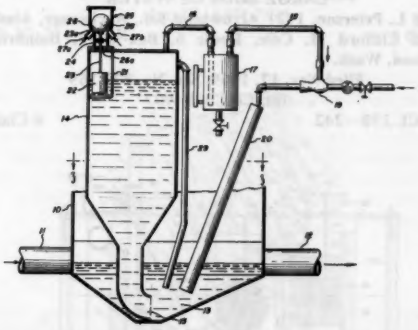
tinuously recirculated to the upper-layer slurry in the chamber. The mixture supply, slurry product discharge, and aqueous phase drawoff are so controlled as to establish and maintain a flow-continuity equilibrium in the chamber whereby the retained quantities of the slurry and aqueous phase are maintained constant.

3,661,261

METHOD AND APPARATUS FOR FLUSHING SEWERS

Arthur A. Lemke, Evanston, Ill., assignor to FMC Corporation

Filed Dec. 31, 1970, Ser. No. 103,075
Int. Cl. B01d *21/00*
U.S. Cl. 210—83 **8 Claims**



This application describes method and apparatus for creating a flow of aqueous waste periodically which will eliminate from sewers and manholes any settled solids accumulated therein, which consists of a sewage accumulation tank positioned in a manhole and communicating with the liquid sump thereof at a level below that of the outlet sewer conduit. The tank is adapted with vacuum means to induce flow of sewage into the accumulation tank and means for introducing air into the tank to eliminate the vacuum and to release the accumulated sewage rapidly to join with the normal sewage flow to produce a flushing surge of liquid flowing in the sewer conduit.

3,661,262

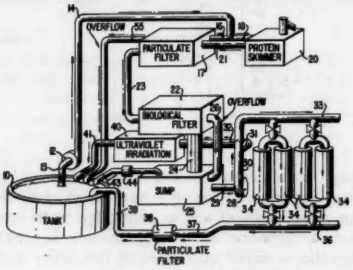
FILTRATION AND CIRCULATION SYSTEM FOR MAINTAINING WATER QUALITY IN MARICULTURE TANK

Graham Hodge Sanders, Elizabeth City, N.C., assignor to Oceanography Mariculture Industries, Inc., Riviera Beach, Fla.

Filed Aug. 25, 1970, Ser. No. 66,826
Int. Cl. F04h *3/20;* **A01k** *63/00*
U.S. Cl. 210—169 **16 Claims**

A filtration and circulation system for maintaining the water quality in a fish tank favorable for promoting the

production and growth of fish therein and for circulating water therethrough at a rate designed to provide a high rate of water exchange in the tank. The system includes particulate, biological and activated charcoal filters serially arranged in pressurized and unpressurized sections thereof for converting or removing ammonia, waste food and excrement from the water. In addition, parallel flow paths from these filters through a protein skimmer and an ultraviolet sterilizer section, respectively, are provided for lower volume treatment of the water being circulated therethrough.

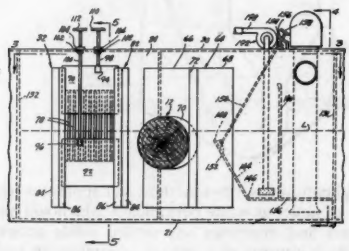


3,661,263

APPARATUS FOR SEPARATING AN OIL SLICK FROM A LARGE BODY OF WATER

David L. Peterson, 1121 Arrowhead Rd., Anchorage, Alaska, and Clifford M. Cole, Route 6, Box 6197, Bainbridge Island, Wash.

Filed Nov. 17, 1969, Ser. No. 877,169
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **6 Claims**



A V-shaped oil slick sweeping system including a log boom as one arm and an oil barge as the other arm, and wherein the barge is outfitted and compartmentalized to receive mixed water and oil, and wherein means is provided on the barge to separate the oil from the water, and to retain the former while discharging the latter.

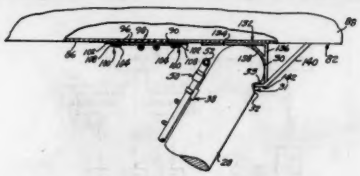
3,661,264

LOG BOOM SYSTEM FOR SWEEPING OIL SLICKS FROM A LARGE BODY OF WATER

David L. Peterson, 1121 Arrowhead Rd., Anchorage, Alaska, and Clifford M. Cole, Route 6, Box 6197, Bainbridge Island, Wash.

Filed Dec. 1, 1969, Ser. No. 881,163
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **7 Claims**

A log boom for sweeping an oil slicked body of water, the boom being formed of a buoyant material and being connected in towing relationship with a suitable vessel, the boom being provided with jet nozzles submerged below the oil slicked surface and connected with a fluid source, water for example, to induce a current flow on the oil slick to force the oil slick in a direction away from the leading side of the boom for collection in the vessel, the fluid under pressure preventing oil slick leakage under, through or over the boom due to the existence of currents, waves or winds.

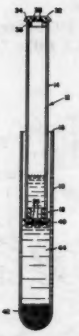


3,661,265

SERUM SEPARATOR TYPE CONTAINER

Donald J. Greenspan, Riverside, N.J., assignor to Contemporary Research and Development Corporation, Philadelphia, Pa.

Filed July 27, 1970, Ser. No. 58,557
Int. Cl. B01d *33/00;* **C01b** *21/06*
U.S. Cl. 210—359 **13 Claims**



Following mechanical or chemical separation of serum or plasma from the formed elements of blood, the serum or plasma is physically isolated from the precipitated formed elements by inserting a plug into the collection tube. The plug consists of a fibrous filter disc fastened to a rubber member having perforations which open when the pressure underneath the plug is greater than the pressure above the plug, but which are otherwise closed. A handle for manipulating the plug functions as a container to collect and remove serum or plasma. In an alternative embodiment, the handle is removably attached to the plug so that the plug can be left in place in the collection tube, maintaining isolation between the serum and the formed elements. In another alternative, the plug is provided with a container for collecting and storing serum. A similar plug inside the container is used to effect an additional filtration step.

3,661,266

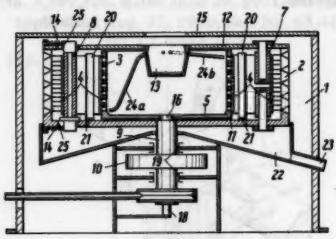
FILTER BELT CENTRIFUGE

Julius Von Rotel, Dortmund-Wambel, Germany, assignor to Reineveld N.V., Delft, Netherlands

Filed Oct. 26, 1970, Ser. No. 83,744
Claims priority, application Germany, Nov. 4, 1969, P 19 55 274.0
Int. Cl. B04b *3/08*
U.S. Cl. 210—370 **11 Claims**

A filter belt centrifuge comprising filter belts moving in a rapidly rotating cage, said belts being tensioned by rollers

and driven at their inner pass contacting the outer surface of a drive drum. The perforated drive drum is centrically positioned within the cage and rotates with slightly different speed of rotation. The filter belts are tensioned with constant force and in proportion to the generated centrifugal force by



tension rollers acting on the inner surface of the outer belt pass.

A distribution pot or cylinder having a pair of conical sec tions supplies the material to be filtered in two vertical planes onto the width of the filter belts uniformly distributed thereon by means of tubes attached to its major diameter.

3,661,267

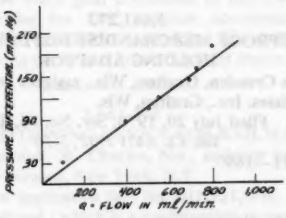
SOLID FILTERS

Finley W. Markley, Naperville, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 3, 1970, Ser. No. 86,444

Int. Cl. B10d *39/14*

U.S. Cl. 210—510 **4 Claims**



A rigid open-cell plastic foam body useful, for example, as a filter is prepared by mixing equal parts of a diglycidal ether of bisphenol A epoxy resin and the reaction product of an excess of a polyfunctional amine and a polyfunctional fatty acid with two parts of water while avoiding the entrapment of air in the mixture to form an emulsion in which water is the continuous phase, casting the emulsion in the desired form and curing the emulsion.

3,661,268

STORAGE RACK FOR CLOTHES HANGERS

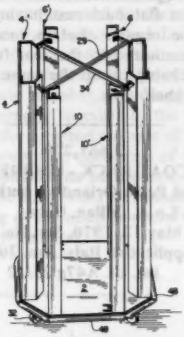
Benjamin Steven Boley, Richmond, Va., assignor to Thalhimer Brothers, Incorporated, Richmond, Va.

Filed May 7, 1970, Ser. No. 35,475

Int. Cl. A47f *7/00*

U.S. Cl. 211—49 R **9 Claims**

A storage rack for clothes hangers comprising a base, at least two pairs of stacking columns each mounted substantially perpendicular to the base and shaped to receive the outer portions of a clothes hanger, at least one of the stacking columns of each pair being slidably mounted on the base to adjust each pair of stacking columns to a size that accommodates the hanger to be stored. A bracket interconnects adjacent members of adjacent pairs of the stacking columns and when the bracket connects to a slidably



mounted stack column it is both slidably mounted of each on the interconnected stack columns and also slidably adjustable between the interconnected stack columns.

3,661,269

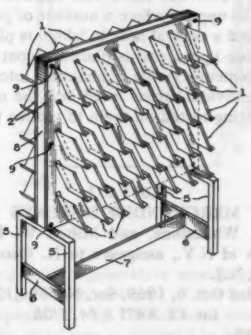
DISPLAY RACK FOR PERIODICALS AND THE LIKE

Robert K. Scherzer, Liverpool, N.Y., assignor to Gaylord Bros., Inc., Syracuse, N.Y.

Filed Nov. 6, 1970, Ser. No. 87,494

Int. Cl. A47f *7/00*

U.S. Cl. 211—49 R **5 Claims**



A periodical display rack comprising a plurality of inclined shelf units anchored to a common vertical support, each of said shelf units being constructed from a one-piece sheet metal blank providing a generally rectangular flat back-rest having a mounting flange extended perpendicularly thereto along one lateral edge thereof, a second flange extended perpendicularly thereto along the opposite lateral edge and serving as a combined stiffener and label supporting surface for the back-rest, and also having a toe-flange extended perpendicularly thereto along the bottom edge of the back-rest to be engaged by the lower edges of periodicals when the latter are placed flat against the inclined back-rest for displaying the periodicals in a position disposed edgewise to the common shelf support. The common shelf support may have the form of a vertical wall or other flat surface such as a panel, and in the case of panel type supports, the panels may be attached directly to a wall like a large picture, or alternatively may be provided with supporting legs or any other desired type of self-sustaining supporting base or stand, with the base preferably forming storage compartments to store periodicals therein when not displayed on the shelf units. The shelf units

may also be provided with quickly attachable and detachable extender shelves of larger size than the regular shelf units to accommodate periodicals of larger size than those normally displayed on the regular shelf units, each of said extender shelves including a flat back-rest having a toe-flange corresponding to the regular shelves, and having yieldable clamping means anchored to the rear face of the extender back-rest to detachably clamp the same to the back-rest of any of the regular shelf units.

3,661,270

COLLAPSIBLE COAT RACK - UMBRELLA STAND UNIT

Roberto Lucci, and Paolo Orlandini, both of Milan, Italy, assignors to Velca S.p.A., Milan, Italy

Filed May 12, 1970, Ser. No. 36,617
Claims priority, application Italy, Jan. 20, 1970, 20532 B/70
Int. Cl. A47g 25/12
U.S. Cl. 211—62 1 Claim

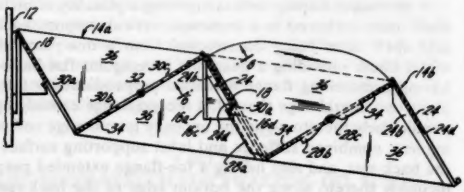
A coat rack - umbrella stand unit consisting of a hollow base having in its upper surface a number of peripheral holes for umbrellas and a central hole in which is placed a tubular element at whose upper end is placed a coat rack element. The tubular element can be dismantled into a number of parts and the individual parts fitted into the umbrella holes, the coat rack being rested on them to reduce the bulk of the packaging.

3,661,271

MERCHANDISE DISPLAYS

Robert Fisher, Whitestone, and Milton W. Herzog, Valley Stream, both of N.Y., assignors to H. Goodman & Sons, Inc., Kearny, N.J.

Filed Oct. 6, 1969, Ser. No. 864,124
Int. Cl. A47f 3/14, 5/08
U.S. Cl. 211—88 11 Claims



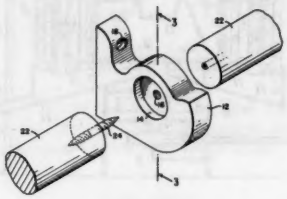
Multiple merchandise display trays are interlocked front-to-back and side-by-side. The front-to-back assembly utilizes integral interlocking formations of the trays. Barbed spring clips maintain the side-by-side assembly. Brackets at the rear of the back trays support the assembly on slotted uprights, and the brackets provide a latitude of adjustment to accommodate the positions of the uprights to the size of the tray assembly. Brackets can also be used to support the rear trays on standard apertured board.

3,661,272

CURTAIN ROD SUPPORT

Edward G. Di Panni, Jr., Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Filed Oct. 19, 1970, Ser. No. 81,640
Int. Cl. A47h 1/02
U.S. Cl. 211—105.1 9 Claims



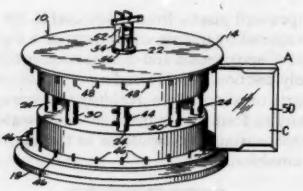
A curtain rod, supported by brackets at each end, is provided with a central support which both supports the midportion of the rod and holds the rod in a position of balanced symmetry with respect to its supports. The center support comprises a base element that can be mounted on a wall and which has sides which extend outwardly from the wall. Each side has a socket cut into it and the sockets are axially aligned and adapted to receive the end of a curtain rod. Also an axially aligned hole is provided, communicating between the two sockets. Before mounting, a curtain rod is cut into two sections. One section is then inserted respectively into each socket and held in place by a fastening device which attaches to each rod end and passes through the hole.

3,661,273

THEFTPROOF MERCHANDISE DISPLAY HAVING HOLDING ADAPTOR

Louis John Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed July 20, 1970, Ser. No. 56,507
Int. Cl. A47f 5/02, 5/10
U.S. Cl. 211—169 5 Claims



An adaptor for holding an article to be displayed on a theftproof merchandise display. The adaptor comprises the article to be displayed and holds it in locked position in the display and when the display is unlocked, and shifted to a releasing position, the adaptor is readily removed from the article it holds, thus freeing the article. The adaptor is made from a plastic such as polypropylene and is formed with living hinges which permit the adaptor to be repeatedly folded around the article and removed therefrom without damage to the adaptor; there is no need for special hinges or the use of tabs in holding the movable parts of the adaptor together.

3,661,274

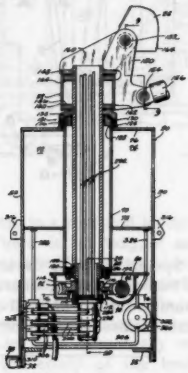
VEHICLE MOUNTED HOIST

Frank G. Woodside, 1721 E. Fox Lane, Milwaukee, Wis., and Richard F. Uren, P. O. Box 303-E-H 3, Bowling Green, Ohio

Original application Jan. 14, 1969, Ser. No. 798,573, now Patent No. 3,589,526, dated June 29, 1971. Divided and this application Aug. 31, 1970, Ser. No. 68,413

Int. Cl. B66c *23/84*

U.S. Cl. 212—68 1 Claim



A box frame reinforced by the walls of oil reservoirs has a prefabricated tubular core sleeve on which mast bearings are assembled in inherent alignment. The structure of the main and jib booms is such as to yield high ratio of strength in relation to weight and the tying of the hinge points of the boom and operating cylinder to each other as well as to the mast gives stability. A worm gear connected to the lower end of the mast provides for 360° rotation accommodated by swiveled hydraulic manifold connections. The stabilizer legs are not only strong per se but brace the hoist frame.

3,661,275

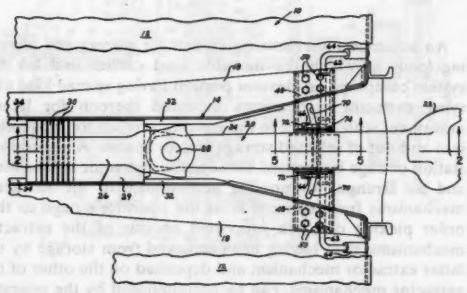
COUPLER POSITIONING DEVICE FOR RAILWAY CARS

Robert W. Randolph, St. Charles, Mo., assignor to ACF Industries Incorporated, New York, N.Y.

Continuation of application Ser. No. 801,921, Feb. 7, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 715,592, Mar. 25, 1968, now abandoned. This application Dec. 7, 1970, Ser. No. 95,878

Int. Cl. B61g *7/12*

U.S. Cl. 213—20 16 Claims



A coupler positioning device for railway cars comprising an elastomeric member connected to the shank of a coupler for lateral movement therewith and deflecting in shear upon such lateral movement. The lower surface of the elastomeric member is held against movement at a preselected position beneath the coupler shank and the upper surface of the elastomeric member is connected to the coupler shank for lateral movement with the coupler. Such lateral movement of the coupler is against the bias of the elastomeric member and the elastomeric member deflects in shear. After the deflection of the elastomeric member, the coupler is returned by the bias of the elastomeric member to the preselected position with respect to the longitudinal axis of the center sill. A coupler carrier adjacent the open end of the center sill is spaced from the coupler by the elastomeric member and acts as a stop to limit the downward movement of the coupler upon lateral swinging of the coupler and a vertical compression of the elastomeric member.

3,661,276

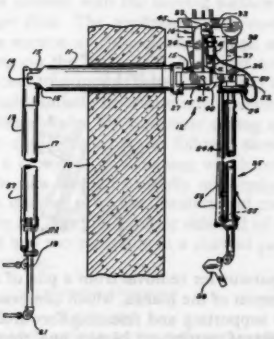
EXTENDED REACH COUNTERWEIGHT

Robert W. Wiesener, Roseville, Minn., assignor to Programmed & Remote Systems Corporation, St. Paul, Minn.

Filed Nov. 14, 1969, Ser. No. 876,899

Int. Cl. B25j *3/00*

U.S. Cl. 214—1 CM 8 Claims



In an extended reach master-slave manipulator a counterweight mounted on the master side of the unit which automatically compensates for additional counterweighting needed when the slave arm is changed in length relative to the master arm. Mounting the counterweight on the master side of the unit reduces the total amount of counterweighting necessary, eliminates many parts which previously controlled the extended reach counterweight on the slave arm, and still accomplishes the feature of having the counterweight automatically adjust for differential extension of the slave arm as well as for an offset between the slave and master arm.

3,661,277

POSITIONING MEANS FOR MATERIAL CUTTER

Dorse James Young, Centerville, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

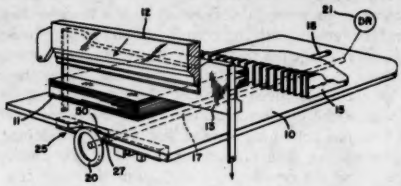
Filed Jan. 8, 1970, Ser. No. 1,506

Int. Cl. B23q *7/00*

U.S. Cl. 214—1.6 3 Claims

A material cutting device having a backgauge which may be manually positioned by means of a hand wheel accessible to the operator also includes a position indicating tape upon which visible indicia representing the backgauge position are printed or engraved. The visible indicia may be referred against an index mark located adjacent a circular scale

mounted to rotate with the hand wheel. The close proximity of the circular scale, the index mark, and the visible indicia



on the control tape facilitates the positioning of the backgauge by the operator.

3,661,278

APPARATUS FOR REMOVAL FROM A PILE OF THE LOWERMOST CARDBOARD BLANK

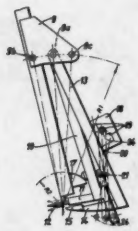
Martin Hammerle, Mullheim, Baden, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed July 8, 1970, Ser. No. 53,259

Claims priority, application Germany, July 19, 1969, P 19 36 778.3

Int. Cl. B65g *59/06*

U.S. Cl. 214—8.5 K **3 Claims**



An apparatus for removal from a pile of cardboard blanks the lowermost of the blanks, which comprises two separating members supporting and releasing forwardly the lower edge of the pile of cardboard blanks and thereby gripping the blank next to the lowermost of the blanks. A slide removes the blank released from the blank column out of the pile. The separating members comprise an engaging ledge supporting the blank column and a row of needles fixing by piercing the blank column next to the lowermost of the blanks at the end face, both of the separating members are suspended by means of angle members on different carrying rods with the same pivot point and swing in and out alternately by means of a common driving means.

3,661,279

DEVICE FOR TRANSLOADING FLOATING CONTAINERS

Karl Macrander, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

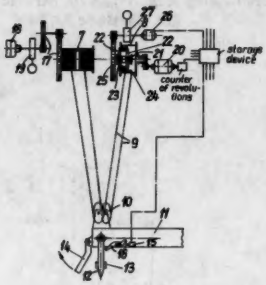
Filed May 25, 1970, Ser. No. 39,985

Claims priority, application Germany, Nov. 12, 1969, P 19 56 743.2; June 11, 1969, P 19 29 523.9; Mar. 19, 1970, P 20 13 082.9

Int. Cl. B65g *67/58*

U.S. Cl. 214—15 R **15 Claims**

A transloading system, especially for ships, in which a support frame has coupling devices for connection thereof to a container while a crane has winches from which cables lead downwardly to the support frame and over idlers thereon and then back up to drums on the crane. Drive motors reversibly actuate the winches while the drums can be biased in cable take-up direction while being prevented from moving in cable pay-out direction, or can be permitted to move in either direction. The drums provide the means for holding the cables taut when a floating container rises and falls due



to wave action. Special coupling devices are shown to connect the support frame to the containers and a control system is provided to monitor the rise and fall of a floating container and initiate control actions in conformity therewith.

3,661,280

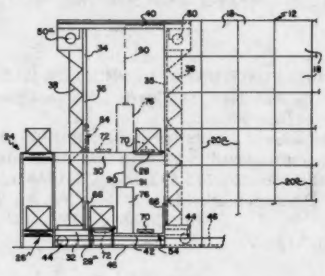
AUTOMATIC STORAGE AND SEMI-AUTOMATED ORDER PICKING SYSTEM

Wayne G. Atwater, Willoughby, Ohio, assignor to The Triax Company, Cleveland, Ohio

Filed Aug. 27, 1969, Ser. No. 853,325

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **13 Claims**

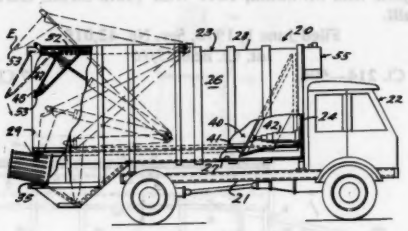


An automatic warehousing system for storing and unstoring loads in which the movable load carrier unit for the system comprises an elevator portion having spaced load carrying extractor mechanisms mounted thereon for lateral movement with respect to the elevator portion for movement into and out of selected storage bins or spaces. An operator's station or cage is disposed between the extractor mechanisms and so arranged to provide accessibility to the extractor mechanisms from either side of the operator's cage so that order picking of stock supported on one of the extractor mechanisms after having been removed from storage by the latter extractor mechanism and deposited on the other of the extractor mechanisms, can be accomplished by the operator from his work station or cage. The arrangement is such that the operator's station is also movable vertically relative to the elevator portion. A multi-level conveyor system is provided for feeding loads into and out of the system.

3,661,281
REFUSE COLLECTING VEHICLE

William A. Herpich; Glenn S. Park, and George W. Palmer, all of Galion, Ohio, assignors to Peabody Galion Corporation, Galion, Ohio

Filed Apr. 15, 1970, Ser. No. 28,566
Int. Cl. B65f 3/00
U.S. Cl. 214—83.3 7 Claims

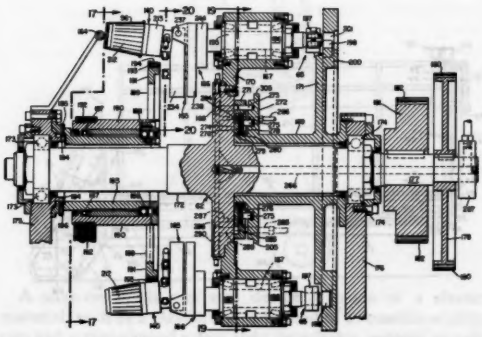


This invention relates to a rear end loader type of refuse collecting vehicle. There is no tailgate and the loading hopper, rather than being in the tailgate, is in the rear of the vehicle body. A packing blade moves refuse from the hopper into the forward portion of the body and in one embodiment may be reversed to sweep refuse from the hopper to a point exterior of the vehicle. A longitudinally movable ejector panel is mounted transversely of the body. During the discharging of refuse from the open rear end of the body the packer blade is in an elevated position and the refuse is discharged by the ejector panel between the elevated packer blade and the hopper. In some embodiments an auxiliary floor is provided in the hopper.

3,661,282
METHOD OF CONTINOUSLY MOVING CONTAINERS THROUGH A TREATMENT PROCESS

Eric S. Buhayar; James E. Hazard, both of Swarthmore; John J. Jaagus, Broomall; Fred W. Werner, Media; Robert W. Wheeler, Milmont Park, all of Pa., and Robert C. Crowe, Cherry Hill, N.J., assignors to Scott Paper Company, Delaware, Pa.

Original application June 9, 1967, Ser. No. 644,955, now abandoned. Divided and this application Mar. 4, 1970, Ser. No. 16,356
Int. Cl. B66c 1/02
U.S. Cl. 214—152 7 Claims



A method and apparatus is disclosed for printing on the sidewalls of containers such as cups having a generally circular cross-section and a cylindrical or frusto-conical shape. The apparatus is designed for continuous operation as distinguished from indexed operation. Methods and apparatus are disclosed which are used to accomplish certain portions of the over-all printing method, which form parts of the over-all printing apparatus, and which also have separate utility in other applications. Among these are a method and apparatus for individually separating and feeding containers from axially aligned or nested relationship in a stack, a turret assembly and a method for moving containers in supported condition through a treatment station, a print blanket assembly including a method and means for controllably pivoting the print blankets during printing, a method and apparatus for removing containers from an orbiting mandrel without contacting the printed sidewall, and a method and apparatus for drying decorating material on the sidewalls of printed containers.

The feeding apparatus employs several successive container conveying sections, two of which operate at an increased speed to separate containers from a line or stack and feed them to a remote position. The turret assembly comprises a rotatable frame carrying a plurality of rotatably mounted mandrels through an orbital path including a treatment section and includes a friction wheel for accelerating the mandrels to a given rotational velocity in a section of the orbital path prior to the treatment section. Cam means are provided to control the direction of tilt of the axis of each mandrel as it passes through the treatment section when the surfaces of hollow frusto-conical objects are to be treated. The printed blanket assembly includes apparatus for pivoting the print blankets during contact with the moving surface to be printed so that contact with the moving surface is maintained for a longer time. The apparatus for removing containers includes a suction cup moveable through an orbital path and operating on the end of the container to transfer successive containers to gripping belts which feed it rapidly onto a conveyor substantially free from any bouncing action or other motion disturbance. The container drying apparatus includes guides to cause containers to follow a skewed path along and across a conveyor in a manner which rotates the container about its axis and substantially uniformly exposes its sidewall, and a number of radiant heaters and coolers arranged to circulate air over the exterior sidewall of the container as it rotates and moves axially in a skewed path along and across the conveyor.

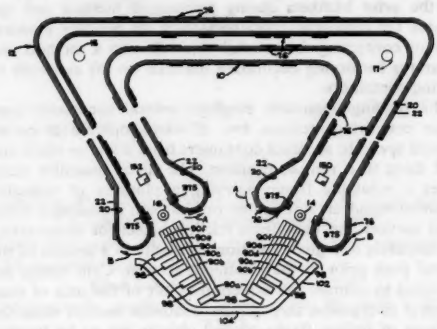
3,661,283
METHOD OF AND APPARATUS FOR STORING A FLUENT MATERIAL

Eduard F. Fischer, West Vancouver, British Columbia, Canada; Edwin Farnworth, Everett, and Elmer Christensen, Kirkland, both of Wash., assignors to The Black Clawson Company, Hamilton, Ohio

Filed May 6, 1970, Ser. No. 35,180
Int. Cl. B65g 65/28
U.S. Cl. 214—152 4 Claims

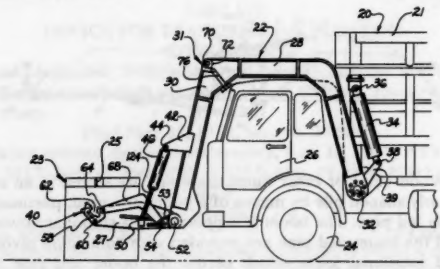
Wood chips or other fluent materials are stored in an annularly shaped pile by means of a boom mounted, pneumatically fed pipe. The boom is supported by a stationary tower, and the boom and pipe are provided with coincident pivotal and rotational joints which permit the boom and pipe assembly to be driven in vertical and horizontal planes separately or simultaneously by drive mechanism located on the tower to control the annular ad transverse dimensions of the pile.

3,661,284
CONVEYOR SYSTEM
Robert J. Traube, San Mateo, Calif., assignor to FMC Corporation, San Jose, Calif.
Original application Aug. 21, 1968, Ser. No. 754,443, now Patent No. 3,640,412. Divided and this application Nov. 17, 1969, Ser. No. 871,297
Int. Cl. B65g 47/10
U.S. Cl. 214—152 9 Claims



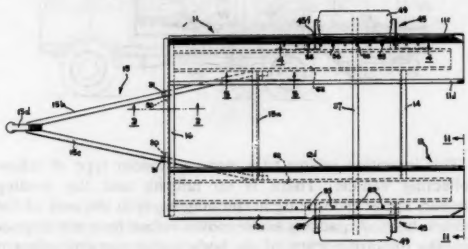
A storage and retrieval system for goods has two power operated conveyors movable in separate endless loops past two (or more) spaced apart picking stations, each picking station common to both conveyors. Each conveyor has bins with compartments in which goods are stored. Although the bins on each conveyor remain in the same sequence, the bins are movable relative to each other on the conveyor to define "buffer" zones which permit simultaneous picking by two spaced apart pickers. The control system for the conveyors includes a reader which receives digital data concerning a group of orders to be picked from a stack of cards, each card giving the identity, quantity, and distribution of one of the articles to be picked. The two conveyors are automatically stopped alternately with the bins containing ordered goods at the picking stations, and the operator at each picking station picks goods from the bins in accordance with a read-out unit which displays the card data. A plurality of packing lanes originate at each picking station and terminate at a plurality of packing stations. Each picker distributes goods to the separate packing lanes in accordance with the read-out unit at the picking station.

3,661,285
REFUSE HANDLING APPARATUS
William S. Appleman, Galion, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.
Filed Aug. 5, 1970, Ser. No. 61,113
Int. Cl. B65f 3/04
U.S. Cl. 214—302 14 Claims



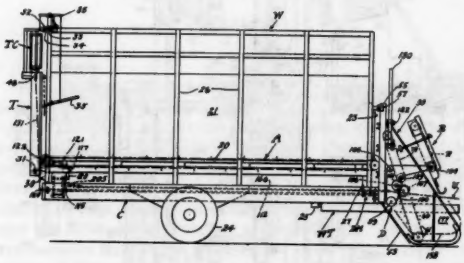
A refuse handling vehicle of the front-loading type provided with improved lift and dump apparatus for dumping waste materials from containers into the container of the vehicle. The machine is characterized by improved lift arms which are constructed to be resiliently yieldable so as to absorb shocks and stresses encountered during the pick-up and dumping of refuse containers.

3,661,286
VEHICLE TRAILER
Marjorie Ann M. Smith, 1441 West 190th Street, Gardena, Calif.
Filed June 1, 1970, Ser. No. 42,015
Int. Cl. B60p 3/10
U.S. Cl. 214—506 7 Claims



A vehicle trailer has a pair of parallel runners for supporting the vehicle to be towed, these runners being joined together to form an integral structure by means of cross braces. A triangular tongue member for connecting the trailer to a towing vehicle is pivotally attached to each of the runners by means of hinge devices so as to allow the tilting of the runner structure relative to the tongue, means further being provided to lock the tongue to the runners for normal towing. The device further includes a simple wheel-axle structure which is removably attached to the runners for ready adjustment of its longitudinal position therealong for optimum handling of the load.

3,661,287
BALE WAGON
Horace G. McCarty, Leola; Keith B. Anderson, Terre Hill, and David D. Stoltzfus, Gap, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 2, 1970, Ser. No. 25,137
Int. Cl. B60p 3/00
U.S. Cl. 214—520 4 Claims



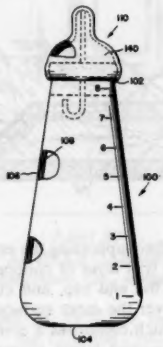
A bale wagon having bale pick up and bale thrower mechanism for picking up bales from the ground and for throwing them into the wagon and bale deflecting means associated with the pick up and thrower mechanism to direct bales to particular locations in the wagon.

3,661,288

INSULATED NURSING BOTTLE

Evelyn Noll, 937 Lincoln Boulevard, Santa Monica, Calif.

Filed Aug. 3, 1970, Ser. No. 60,393
Int. Cl. A61j 9/00; B65d 39/02
U.S. Cl. 215—11 R 4 Claims



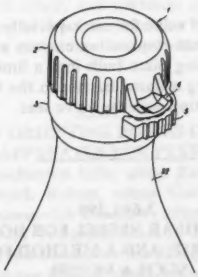
An insulated nursing bottle, characterized by its portability while fully insulated to retain for substantial periods of time the imposed temperature of the fluid ingredients contained therein. Of especial significance is the means provided herein for substantially full consumption of the contents by the infant, less the intake of disturbing quantities of air. More especially, the particular adaptation of the rigidized nipple portion hereof is readily removable, replaceable and cleansable.

3,661,289

BOTTLE CAP SEAL DEVICE WITH A TEAR-OFF SAFETY STRIP

Bruno Segmuller, Niederfeld, Switzerland, assignor to Segmuller AG, Stein am Rhine, Switzerland

Filed Aug. 26, 1970, Ser. No. 67,127
Claims priority, application Switzerland, Sept. 21, 1969, 15732/69; Germany, Apr. 2, 1970, P 20 15 780.6
Int. Cl. B65d 41/22
U.S. Cl. 215—41 7 Claims



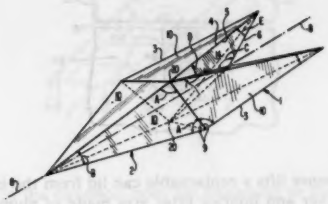
A snap-on bottle cap seal device is made of a elastic material, such as a plastic, and is formed of a reusable sealing cap and a ring-shaped safety strip detachably secured to and extending circumferentially about the lower end of the cap when it is initially secured on a bottle. A lifting lug is formed on the lower edge of the sealing cap and a tear-off tab, attached to the safety strip, is secured by small web sections to the lug.

3,661,290

WORKING CHAMBER

Arthur Clyde Davenport, P. O. Box 327, Broussard, La.

Continuation-in-part of application Ser. No. 791,630, Jan. 16, 1969, now abandoned. This application June 24, 1970, Ser. No. 49,477
Int. Cl. B65d 7/02
U.S. Cl. 220—1 R 4 Claims



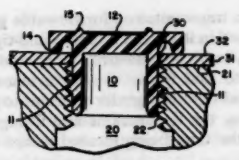
A variable configuration and volume chamber which, in its most basic form, consists of a plurality of first substantially rigid panels the marginal edges of which form a substantially rectilinear acute triangle and a plurality of second substantially rigid panels, the marginal edges of which form a substantially rectilinear obtuse triangle. The chamber is formed by hinge-joining marginal edges of respective panels in a particular arrangement such that the jointure of the second rectilinear obtuse triangle panels together with the obtuse vertices of the joined second panels intersect at the longitudinal axis of the chamber whereby rectilinear movement of the intersection is maintained in a plane of symmetry of the chamber throughout actuation of the chamber.

3,661,291

FASTENERS AND CLOSURES

Harry Hetzer, Depew, N.Y., assignor to GTI Corporation, Meadville, Pa.

Continuation-in-part of application Ser. No. 873,584, Nov. 3, 1969, now Patent No. 3,578,200. This application Aug. 24, 1970, Ser. No. 66,223. The portion of the term of the patent subsequent to May 11, 1988, has been disclaimed.
Int. Cl. B65d 39/04; F16l 57/00; B65d 59/02
U.S. Cl. 220—42 B 6 Claims

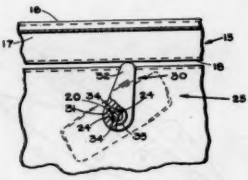


A fastener and closure is provided for areas surrounding threaded openings comprising a cover member having openings matching said threaded openings, a resilient cylindrical member adapted to slidably fit within said opening and having an interrupted thread on the exterior thereof intermediate the ends engaging the threads in said threaded opening, a circular end cap covering one end of said cylindrical member and extending beyond the periphery forming an annular radial flange, a depending ring at the outer periphery of the flange, spaced from the cylinder and engaging the surface surrounding the port and spacing the flange therefrom when the cylinder is in place in said opening whereby the cylinder is under axial tension between the thread and end cap.

3,661,292
CAN WITH LID OPENER

Albert R. Chappell, Jerseyville, Ill., assignor to The Metalife Company, Wentzville, Mo.

Filed Sept. 25, 1970, Ser. No. 75,454
Int. Cl. B65d 43/04
U.S. Cl. 220—43 R 1 Claim

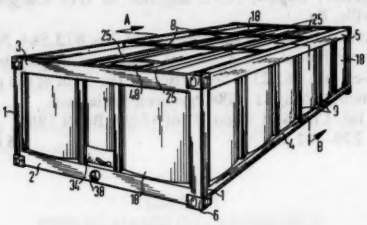


A lid opener lifts a replaceable can lid from the inside. An exterior lever and interior lifter arm made of aluminum are connected by a ribbed steel rivet driven through them and through the upper wall of the can. Turning the internal lever presses one of the lifter arms against the inner lid surface. The rivet ribs transmit adequate lifting torque.

3,661,293
RECTANGULAR FREIGHT CONTAINER FOR INTERNATIONAL COMBINED TRAFFIC, PARTICULARLY FOR FLOWABLE BULK GOODS

Helmut Gerhard, Weitefeld/Sieg, and Hans-Helmut Reichmann, Wahlbach/Siegen, both of Germany, assignors to Westerwalder Eisenwerk Dr. Paul Gerhard KG, Weitefeld am Sieg, Germany

Filed Feb. 26, 1969, Ser. No. 802,391
Claims priority, application Germany, Nov. 14, 1968, P 18 08 755.3; Feb. 27, 1968, W 41 737/81c
Int. Cl. B65d 7/04, 7/44
U.S. Cl. 220—71 33 Claims



A rectangular transcontainer for flowable goods, comprising a frame closed in itself and a tank liquid-tight on all sides, wherein part cylindrical outwardly cambered wall elements are connected to said frame in such a manner as to form therewith a liquid-tight box girder resistant to bending, twisting and buckling, the connections and fittings for access to the interior of the tank being located within the contour of said frame.

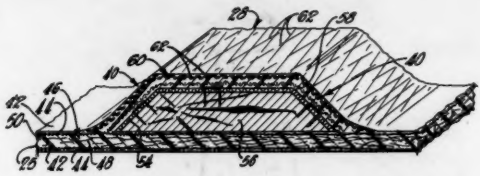
3,661,294
RETAINING WALL FOR FLUIDS AND METHOD FOR PRODUCTION

Lee E. Pearson, Newark, and Jeri O. Clark, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation

Continuation of application Ser. No. 62,678, Feb. 14, 1967, now abandoned. This application Aug. 10, 1970, Ser. No. 62,678
Int. Cl. B65d 7/46, 11/24
U.S. Cl. 220—83 12 Claims

A composite wall of reinforced synthetic resin, for retaining both gases and liquids, that is particularly adapted for underground use in gasoline storage tanks, which are resistant to external compression forces; such as, water flooded earth. The wall is characterized by a very high stiffness factor, produced by a combination of spaced ribs of filament wound material and that are hollow, retained on top of a chopped strand-resin wall, where the chopped strand bridges the spaces between the ribs.

A process involving the steps of forming a tank end cap on a mandrel and thereafter supporting the end cap in space and laying up a resin-rich wall layer of chopped strand and resin in joined relation to the end cap, and curing the wall partially; then forming over the outer surface of the wall a hollow shell structure which comprises a combination of woven roving and filament wound layers superimposed and saturated with wet resin. Then completely curing the composite wall to produce a monolithic structure.



3,661,295
EXPLOSION RELIEF VALVE

Eduard Grunwald, Port Washington, and Walter J. Tuymer, Forest Hills, both of N.Y., assignors to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Mar. 12, 1970, Ser. No. 19,040
Claims priority, application Austria, Feb. 13, 1970, 1308/70
Int. Cl. B65d 25/00
U.S. Cl. 220—88 A 4 Claims

An explosion relief valve for use especially to be applied to a crankcase of internal combustion engines and consisting of a spring loaded closing plate built into a limiting wall of the crankcase and having a flame barrier in the form of stacked metal strips cooperating with the valve seat.

3,661,296
POT, PAN OR SIMILAR VESSEL FOR DOMESTIC USE WITH A HANDGRIP, AND A METHOD FOR MAKING SUCH A VESSEL

Emile Paul Eliza Hamer, 12 Princes Beautrixloan, Wezep, Netherlands

Filed Feb. 13, 1970, Ser. No. 11,064
Int. Cl. B65d 25/28
U.S. Cl. 220—94 A 6 Claims

An assembly for attaching a handle or the like to a pot, pan or similar vessel consists of two metal parts secured to the walls of the vessel at circumferentially spaced locations. A handle of a generally U-shaped configuration has recesses in the legs thereof which receive the metal parts. Fastening

means extend through the handle and engage the metal parts within the recesses to secure the handle to the metal parts in

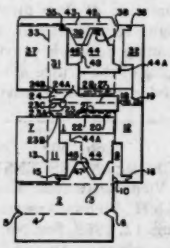
a manner so that no part of the handle is in contact with the vessel wall.

3,661,297

ARTICLE CARRIER

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation

Filed Dec. 21, 1970, Ser. No. 99,731
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 **5 Claims**



A basket style article carrier is disclosed having a bottom wall, side walls joined to opposite side edges of the bottom wall, end wall panels joined to the end edges of the side walls and extending inwardly therefrom, riser panels foldably joined to the inner edges of the end wall panels and extending inwardly of the carrier, a handle secured to the riser panels at one end along vertical fold lines and at the other end by a pair of positioning flaps foldably joined to the other end of the handle and disposed in inwardly enveloping relation relative to the adjacent riser panels which are interconnected with each other, and partition structure secured to each side wall and to the riser panels on each side of the handle, the partition structures being formed by supplemental separate blanks.

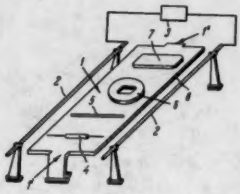
3,661,298

METHOD OF ORIENTING BODIES IN AN ELECTRIC FIELD AND APPARATUS FOR PERFORMING SAME

Benyamin Alexandrovich Ioffe, ulitsa Raunas, 45/2, kv. 81.; Robert Karlovich Kalnin, ulitsa Gorkogo, 53, kv. 19.; Vyacheslav Semenovich Dorofeev, ulitsa Frunzes, II, kv. 5.; Ivan Avgustovich Trushelis, ulitsa B. Aluksnes, 3, kv. 27., all of Riga; Bruno Domenikovich Zheigur, ulitsa Miera, 18, kv. 7., Latviiskaya SSR, Rizhsky raion, Salaspils; Anatoly Andreevich Ivanov, ulitsa Krasnoflotskaya, 53, kv. 33., Gorky, and Vladimir Viktorovich Preis, prospekt Lenina, 82, kv. 12., Tula, all of U.S.S.R.

Filed Dec. 15, 1969, Ser. No. 885,189
Claims priority, application U.S.S.R., Dec. 25, 1968, 1,289,064
Int. Cl. B23q *7/12*
U.S. Cl. 221—171 **6 Claims**

A method of orienting bodies in an electric field and apparatus for performing such method. Bodies are oriented in an electric field generated by a pair of electrodes defining therebetween an orientation zone, the bodies being oriented under the action of a non-uniform alternating electric field, the non-uniformity of which, in a plane extending perpendicularly to the direction from the beginning to the end portion of the orientation zone, is similar to the non-uniformity of an electric field created by two electrically charged points in a plane including these two charged points.

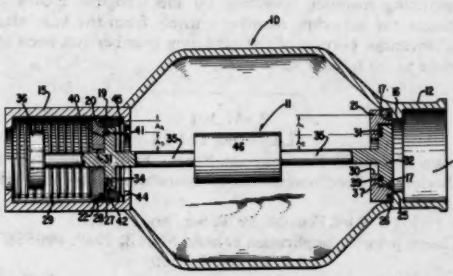


3,661,299

FRICTIONLESS BI-DIRECTIONAL INERTIA RESPONSIVE GAS DISPENSING APPARATUS

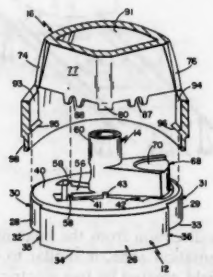
Gerald Durstewitz, Passaic, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed July 15, 1970, Ser. No. 54,912
Int. Cl. B67b *7/00*
U.S. Cl. 222—3 **3 Claims**



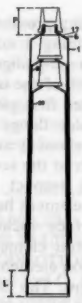
Apparatus for dispensing pressurized gas in response to a change in velocity including a container having an outlet opening and a second opening aligned therewith, and a valving device for sealing both of the openings. The valve device includes a large diameter first piston element at one end which engages an annular flange at the outlet, a smaller diameter second piston element at the other end which engages an annular member at the second opening, and a valve member moveable with respect to the first and second pistons. The first piston element has a central opening and a surrounding sealing surface facing the outlet. The valve member has a third piston element contacting this sealing surface and a fourth piston element contacting the surface of the second piston element. The third and fourth piston elements are interconnected by a rod which carries a mass element. The piston elements are provided with face seals and the pressure within the container normally holds the seals in contact with the surfaces they butt against to seal the openings. The valve member is of sufficient mass to overcome the pressure forces and open the container in response to a predetermined increase or decrease in velocity of the container.

3,661,300
DISPENSING PACKAGE
Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Gillett Park, Boston, Mass.
Filed Oct. 2, 1969, Ser. No. 863,094
Int. Cl. B65d *83/14, 47/10*
U.S. Cl. 222—80 12 Claims



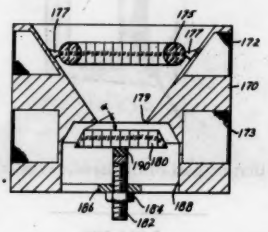
An actuating assembly for actuating a tubular valve stem in a pressurized dispensing package which comprises, in its preassembled state, a base engageable with the package container, a depressible actuating member which has a discharge portion for connection to the tubular valve stem and includes a discharge passage communicating with the valve stem exit port, frangible means extending between the actuating member and the base for supporting the member on the base so that the discharge portion of the actuating member is aligned for assembly with the valve stem, and cooperating structure, engageable with the container or base, including a destructing member operating on the frangible means to separate the actuating member entirely from the base after the discharge portion of the actuating member has been attached to the tubular valve stem.

3,661,301
FLEXIBLE TUBES
Roger Couland, Fontenay-aux-Roses, France, assignor to Societe de Conditionnement en Aluminium Scal GP, Paris, France
Filed Feb. 20, 1970, Ser. No. 13,111
Claims priority, application France, Mar. 3, 1969, 6905587
Int. Cl. B65d *35/00*
U.S. Cl. 222—92 6 Claims



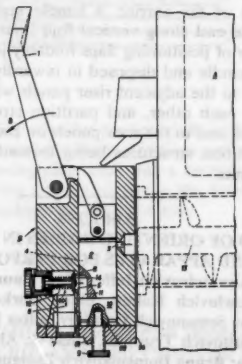
A flexible container comprising a flexible sidewall defining a conical tube which is open at one end wherein the sidewall has a section at the open end in which the tube has an expanded or increased diameter to thereby provide a section with the configuration of a truncated cone to facilitate stacking of a plurality of tubes one inside another.

3,661,302
SOLIDS DISPENSER HAVING MAGNETIC VALVE IN THROAT
David L. Braun, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Mar. 12, 1970, Ser. No. 18,892
Int. Cl. G01f *11/00*
U.S. Cl. 222—226 8 Claims



A magnetic valve for controlling the flow of solids is provided. It consists essentially of an orifice feeding tube with a magnetizing coil surrounding it, so that lines of force of the coil are generated axially of the throat and a spindle fitting into the throat of the tube and having its geometrical axis parallel with the direction of flow through the tube and a magnetic axis at right angles thereto. In addition an anti-bridging and anti-loading device is provided above the spindle to prevent bridging of the orifice at that point by packing of the dry powder and packing of powder against the spindle.

3,661,303
ICECREAM DISPENSER
Otto Prosenbauer, Vienna, Austria, assignor to Hollstein & Fuhrmann Ges.m.b.H., Vienna, Austria
Filed Aug. 12, 1969, Ser. No. 849,337
Claims priority, application Austria, Aug. 19, 1968, A 8057/68; Feb. 4, 1969, A 1112/69
Int. Cl. G01f *11/06*
U.S. Cl. 222—309 16 Claims



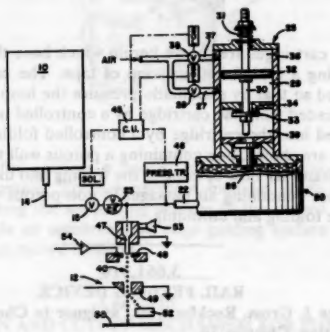
A housing is formed with a cylinder and with an inlet opening communicating with said cylinder. A stationary wall extends across the cross-section of said cylinder and is spaced from said inlet opening in the axial direction of said cylinder. The housing and wall are formed with an inlet opening which communicates with said cylinder and is spaced from said inlet opening in the axial direction of said cylinder on the same side of said inlet opening as said wall. A discharge piston is slidably mounted in said cylinder for movement

between first and second limiting positions and arranged to define with said stationary wall a metering chamber which communicates with said inlet and outlet openings when said piston is in said first limiting position and to engage said stationary wall and close said inlet opening when said piston is in said second limiting position. A valve is arranged to control said outlet opening, closing it when the piston is withdrawn to unblock the inlet opening.

3,661,304
PRESSURE IMPULSE APPARATUS FOR INITIATING FORMATION OF FLUID DROPS

Esteban Martinez, Lambertville, N.J.; Gerald T. Davis, and Russell H. Van Brimer, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 3, 1970, Ser. No. 60,394
Int. Cl. B65d *83/14*
U.S. Cl. 222—394 4 Claims

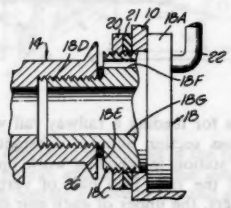


To avoid large initial globs of liquid, or misdirected initial ts or liquid filaments, when starting one or more liquid drop nerators, the flow through the orifice of the generator(s) is itiated with an abrupt and substantial pressure rise time, as applying an initial hydraulic shock in starting the flow.

3,661,305
DISPENSER WITH VENTING MEANS

rl E. Frahm, and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif.

Filed Aug. 4, 1969, Ser. No. 847,029
Int. Cl. B67d *3/00*
S. Cl. 222—481 3 Claims



liquid container has a special fitting onto which either a ure member or a dispensing valve may be threaded. en the closure member is in place it seals a main ensing bore as well as a vent bore. When the dispensing valve is in place it presses a sealing washer against a shouldered portion to prevent leakage through the main bore and also such sealing washer spaces the valve from the vent bore to allow the interior of the container to be vented to the atmosphere.

3,661,306
CLOSURE FOR CONTAINERS AND DEVICE UTILIZING SUCH CLOSURE

Alexander Kuckens, Bellevue 20, 2 Hamburg, 39, Germany

Continuation-in-part of application Ser. No. 6,670, Jan. 21, 1970. This application Dec. 16, 1970, Ser. No. 98,766
Int. Cl. B65d *47/10*
U.S. Cl. 222—504 10 Claims

A tear-away closure is in form of a member of synthetic plastic which is to be fluid-tightly connected with a wall of a container, spanning an opening therein. An annular marginal portion of the member surrounds an aperture and is provided at that axial side thereof which will normally face the interior of the container with circumferentially spaced coupling portions which can engage with cooperating coupling portions on an auxiliary element with which the container is to be connected via the closure member. An inner portion of the member is located within the confines of the annular marginal portion and spans the aperture thereof in the region of the other axial side of the aperture. An annular weakened portion is unitary and fluid-tightly connects the inner and annular marginal portions and comprises first and second circumferentially spaced arcuate sections which are respectively located on an inner and an outer imaginary circle, and third sections which extend at least substantially normal to and connect each second section with two adjacent first sections to define at circumferentially spaced locations a plurality of radial notches which are to afford access to the coupling portions. A gripping portion is in form of a strip of the inner portion which is bounded at its lateral sides by weakened lines one of which merges with the annular weakened portion, and a ring-shaped part of the strip projects from the inner portion and is to be engaged by the fingers of a user.

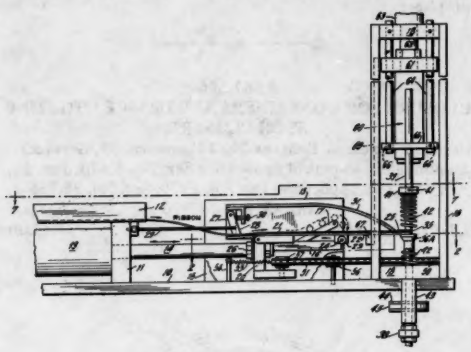
3,661,307
DECORATIVE BOW MAKING APPARATUS WITH SHAPED STAPLING ANVIL

Eugene Jacobson, Englewood, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 19,904, Apr. 4, 1960, now Patent No. 3,545,656. This application Aug. 30, 1970, Ser. No. 60,479
Int. Cl. A41h *43/00*
U.S. Cl. 223—46 8 Claims

The top surface of the rotating spindle of a bow making machine is cup-shaped in cross-section and serves as an anvil

to deflect the legs of a staple which staples together a



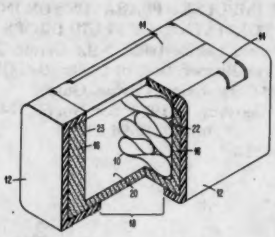
completed bow regardless of the angular position of the spindle relative to the staple source.

3,661,308
CAMERA AND BINOCULAR CHEST SUPPORT FRAME
Samuel Walters, 3134 Dona Emilia Drive, Studio City, Calif.
Filed Mar. 23, 1970, Ser. No. 21,805
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 V **4 Claims**

A support frame for attachment to the lower portion of the chest, for supporting a viewing device such as a camera or pair of binoculars, and having adjustable means for locating the viewing device in a convenient viewing position, the support frame including a generally rectangular body plate which is vertically disposed with its rearward side surface being slightly concave in the horizontal plane, a support arm attached to the lower front central portion of the body plate and extending horizontally forwardly from the body plate, a vertically disposed collapsible post for supporting the viewing device at its upper end with the lower end of the post being attached to the support arm, the post being generally parallel to the body plate and being adjustable both as to its vertical height and as to its horizontal separation from the body plate, and at least one strap for supporting the frame from the person of the viewer.

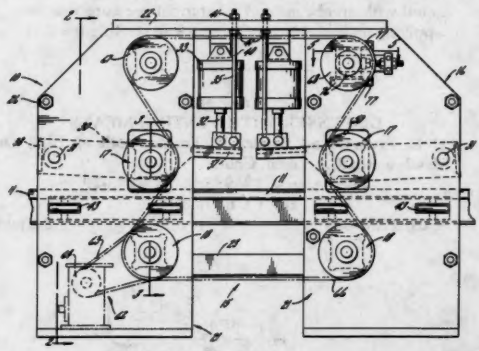
The purpose of the above abstract is to provide a nonlegal technical statement of the disclosure of the contents of the instant patent application and thus serve as a searching-scanning tool for scientists, engineers and researchers. Accordingly, this abstract is not intended to be used in understanding or otherwise comprehending the principles of the present invention hereinafter described in detail, nor is it intended to be used in interpreting or in any way limiting the scope or fair meaning of the claims appended hereto.

3,661,309
LOADING AND UNLOADING AN ENDLESS WEB IN A CARTRIDGE
Paul J. Arseneault, Longmont, and Louis B. Feierabend, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1970, Ser. No. 51,091
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **8 Claims**



Two cartridges are shown herein which have the capability of storing a folded endless loop of tape. The cartridges are designed so that by pneumatic pressure the loop of tape may be unloaded from the cartridge by a controlled unfolding and reloaded into the cartridge by a controlled folding. Two cartridges are shown, one containing a porous wall to permit the appropriate air flow to control the folding and unfolding, and the other containing air passages in non-porous walls to control the folding and unfolding.

3,661,310
RAIL FEEDING DEVICE
Maurice J. Gross, Rockford, Ill., assignor to Chemetron Corporation, Chicago, Ill.
Filed Aug. 14, 1970, Ser. No. 63,764
Int. Cl. B65h *17/20*
U.S. Cl. 226—108 **7 Claims**



A device for feeding a railway rail with a substantially I-shaped cross section along a substantially horizontal path through a station in which a work operation may be performed on the rail. Two pair of vertically spaced, power driven rollers, the upper of each pair being vertically movable, press the rail between themselves and are power rotated to push the rail along the path. A flexible drive powers all the rollers and accommodates the vertical movement of the upper rollers. So that the rollers can engage the uneven surfaces of the rail in tight frictional engagement therewith, each roller comprises a plurality of discs positioned face-to-face and movable individually to adjust to the surface of the

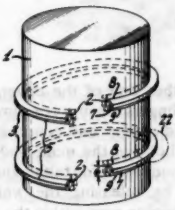
rail. The discs are mounted between power rotated end plates by three pins spaced angularly about the rotational axis of the end plates. To allow individual radial movement of the discs, a sleeve of resiliently deformable material is telescoped over each pin. As each roller is pressed against the rail, each disc presses against the sleeves to deform the latter as that disc comes into contact with the rail to allow the other discs to move relative to the rail until they make contact.

3,661,311

RECORD MEDIUM GUIDE

Henry Ray Warren, Indianapolis, Ind., assignor to RCA Corporation

Filed Mar. 21, 1969, Ser. No. 809,256
Int. Cl. B65h *23/32*; G11b *15/60*
U.S. Cl. 226—198 **4 Claims**



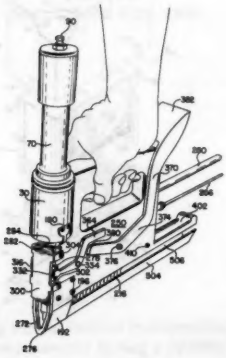
A device for guiding a record medium in a recorder-reproducer system. The arrangement includes guide members intersecting the supporting surface of the record medium, to provide an uninterrupted edge guiding surface along the path of the record medium.

3,661,312

DETECTION AND CUTOFF MECHANISM FOR POWER DRIVEN DEVICES

Henry Pomernacki, Northbrook, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 22, 1970, Ser. No. 57,246
Int. Cl. B25c *1/04*
U.S. Cl. 227—8 **10 Claims**



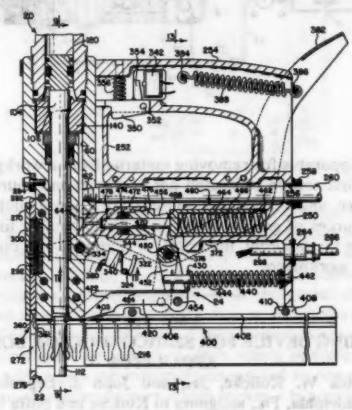
A power device for operating hand tools of the type having a reservoir of stored energy and a means for automatically releasing the energy to operate a drive piston and a hand tool carrying a collated strip of fasteners, the device being fully operable only when it is properly positioned with respect to a workpiece or structure and has detection means for deactuating the releasing of the stored energy to the drive piston if the power device is not so properly positioned. The detection means also includes cutoff means for separating scrap portions of the carrying medium of the collated strip from the balance of the strip which is within the hand tool and still carrying fasteners.

3,661,313

POWER DEVICE HAVING IMPROVED FEED MECHANISM

Henry Pomernacki, Northbrook, and Oliver E. Saari, Niles, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed July 22, 1970, Ser. No. 57,211
Int. Cl. B25c *1/04*
U.S. Cl. 227—136 **6 Claims**



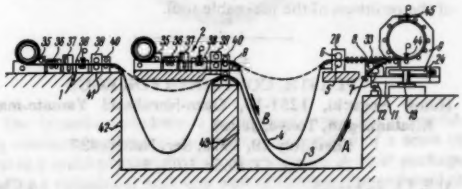
A power device having an improved feed mechanism for advancing collated strips of fasteners in sequential fashion to a power actuated driving mechanism.

3,661,314

MILL TO PRODUCE SPIRAL-WELDED DOUBLE LAYER PIPES

Alexandr Ivanovich Tselikov, ulitsa Chernyakhovskogo, 4, kv. 127; Nikolai Alexeevich Grum-Grzhimailo, Sharikopodshipnikovskaya ulitsa, 2-a, kv. 7; Vadim Anatolievich Verderevsky, Volgogradsky prospekt, 171, kv. 35, all of Moscow; Alexandr Borisovich Vernik, prospekt Lenina, 30, 13, kv. 54, Elektrostal Moskovskoi Oblasti; Boris Pavlovich Skorupsky, ulitsa Pushkina, 19/16, kv. 68, Elektrostal Moskovskoi Oblasti; Igor Illarionovich Kazakevich, prospekt Lenina, 28, kv. 44, Elektrostal Moskovskoi Oblasti, and Ivan Vasilievich Kuznetsov, ulitsa Sovetskaya, 42, kv. 14, Novomoskovsk, all of U.S.S.R.

Filed Dec. 18, 1969, Ser. No. 886,268
Int. Cl. B23k *1/20*
U.S. Cl. 228—15 **3 Claims**

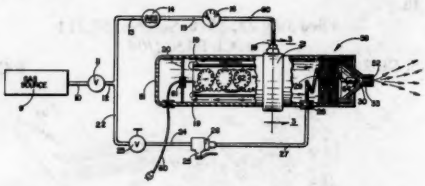


A mill to produce spiral-welded double layer pipes, wherein the strip feeding rolls are combined into two groups each of which feeds one of the strips, and the axes of the rolls rotation are horizontally disposed, these rolls being mounted at an angle, the value of which depends on the pipe diameter and the width of the strips.

3,661,315
MATERIAL REMOVING DEVICE

Charles J. Helton, Santa Ana, Calif., assignor to North American Rockwell Corporation

Filed June 13, 1969, Ser. No. 833,046
Int. Cl. B23k 1/00, 5/22
U.S. Cl. 228—20 24 Claims

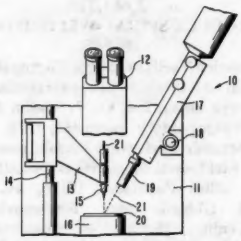


An apparatus for removing material from a workpiece having a first source of heated gas and a second source of gas. The first and second gas sources are housed such that the two sources of gas are selectively dischargeable to heat and remove the material, materials, or materials and components from a workpiece.

3,661,316
AIMING DEVICE FOR SEMICONDUCTOR BONDING APPARATUS

Frederick W. Kulicke, Jr., and John J. Lepone, both of Philadelphia, Pa., assignors to Kulicke and Soffa Industries, Inc., Fort Washington, Pa.

Filed Apr. 13, 1970, Ser. No. 27,955
Int. Cl. B23k 5/22
U.S. Cl. 228—56.5 9 Claims



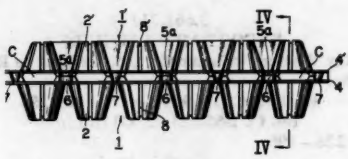
Apparatus for aiming a tool used to perform a mechanical operation on a semiconductor device, including a light pencil which directs a thin beam of light in the area where the tool is to be aimed. The position of the light beam indicates one of the positions of the moveable tool.

3,661,317
PLASTIC CONTAINER FOR EGGS

Hikoji Noguchi, 1251-10, Oaza-Narahashi Yamato-machi, Kitatama-gun, Tokyo, Japan

Filed July 20, 1970, Ser. No. 56,437
Int. Cl. B65d 1/00, 5/48
U.S. Cl. 229—2.5 4 Claims

A plastic container for eggs comprising a main body with cavities and a cover body with cavities which receive eggs in cooperation with the corresponding cavities provided to the main body, said cover body being foldable to the main body and secured to said main body, during the conveyance or handling of the container from a raiser to retailer, mainly by means of a plurality of projections one ends of which are made integral with one of said main body or cover body and the other ends of which are weldable to the other of the main body or cover body and auxiliary by means of convex and concave projections formed on the cover and main body which are snapped to each other when the cover body is folded to the main body, the projections one ends of which

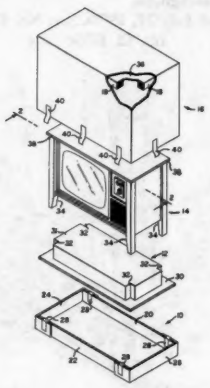


are welded to either one of the cover or main body being releasable by his fingers when a consumer wishes to open the container, and said convex and concave projections acting to secure the cover body to the main body when the container is opened by the consumer for taking out therefrom a desired number of eggs by releasing the welded projections and preserves the remaining eggs within the container.

3,661,318
LIFT-OFF SHIPPING CARTON FOR TELEVISION CABINET

Arthur Peter Miller, Cheektowaga, N.Y., and Leslie Robert Ryan, Smithfield, N.C., assignors to Sylvania Electric Products Inc.

Filed Oct. 21, 1969, Ser. No. 868,002
Int. Cl. B65d 5/50, 85/30
U.S. Cl. 229—23 BT 1 Claim

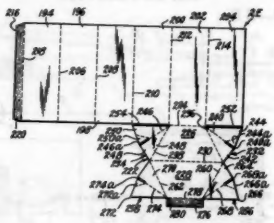


A shipping carton for a television cabinet or the like comprising a bottom tray having upwardly extending sidewalls, a pallet press fitted within the tray, a cover having downwardly extending sidewalls adapted to slidably engage the exterior of the bottom tray sidewalls, a pad member press fitted into the top of the cover. When assembled, the carton encloses the cabinet in an interlocked stacked assembly with the cover secured to the bottom tray by strips of tape or a vertically surrounding band. The assembly permits reopening for complete access to the cabinet by merely cutting the tape or band and lifting off the cover.

3,661,319
EXPANSIBLE AND COLLAPSIBLE MULTI-SIDED STRUCTURES AND BLANKS THEREFOR

Albert O. Koehler, 1217 Durham Road, Riegelsville, Pa.

Filed Mar. 2, 1970, Ser. No. 15,624
Int. Cl. B65d 5/02, 5/36
U.S. Cl. 229—37 31 Claims

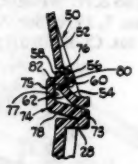


Multi-sided containers having side walls and a bottom wall, formed from a stamped or di-cut integral blank and characterized by having, in certain embodiments of the invention, horizontally projecting feet extending from the bottom wall that serve as stabilizers for the structures. The feet may be defined in part by a lock-slot providing a tab that can be folded upwardly to retain the structure in expanded, although collapsible condition. Alternatively, the lock-slot can be omitted and the feet folded from a horizontal into an upright position and secured to the confronting side wall to provide a permanently erected or expanded structure. In all embodiments of the invention, the blanks are designed so that the bottom wall is collapsible inwardly and upwardly and may be formed by a single bottom section, or by two similar cooperating bottom sections.

3,661,320
EGG CARTON

David Donaldson, 1500 North Van Buren, Wilmington, Del.

Continuation-in-part of application Ser. No. 705,194, Feb. 13, 1968, now abandoned. This application Jan. 19, 1970, Ser. No. 4,146
Int. Cl. B65d 5/66, 1/00
U.S. Cl. 229—44 1 Claim

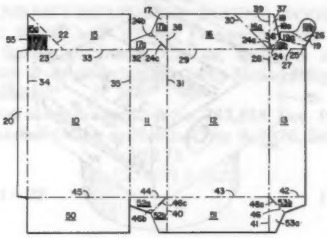


A one-piece egg carton formed from molded material comprising a hollow tray member having a plurality of egg receiving pockets; a hollow cover member having a front wall; a lock flap hinged to and upstanding from the front edge of the tray member and adapted to be contained within the cover member behind the front wall thereof when the carton is in closed condition with the front surface of the lock flap disposed against the rear surface of the cover member front wall; the cover member front wall having a rearwardly extending abutment received within a forwardly facing pocket presented by the lock flap to maintain the carton in closed condition. The lock flap has a longitudinally extending latching bar integral therewith adapted to be received within a longitudinally latching opening situate along intermediate portions of the rearwardly extending abutment in the cover.

3,661,321
CARTON HAVING GUSSETED SIDE FLAPS

Raymond G. Tessmer, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 29, 1970, Ser. No. 50,772
Int. Cl. B65d 5/54
U.S. Cl. 229—51 SC 4 Claims

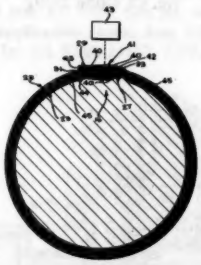


A carton and the method of folding the closure flaps for adhesive application and closing the carton. Gusset side flaps are first folded out and the major flap to which the side flaps are connected is folded in. This forms a virtual coplanar surface to which adhesive is applied. Next the gusset side flaps are folded in and under the major flap to which they are attached. The second major flap is then folded down over the first major flap. Two cut-score lines which operate in conjunction with a grip tab integrally connected to one side flap provide an easy-open feature which makes a triangular opening.

3,661,322
PACKAGE SEAL

Donald E. Norman, Springfield, Mo., assignor to Kraftco Corporation, New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,898
Int. Cl. B65d 35/10
U.S. Cl. 229—55 10 Claims



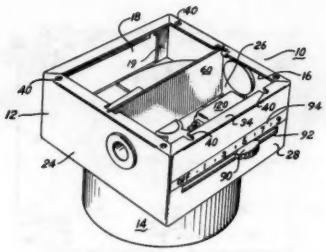
The invention discloses a packaging development providing enhanced resistance to splitting or opening of a seam or seal in a multi-ply wall flexible film package. A chub package having a cylindrical multi-ply wall of flexible film gathered at the end by clenched metal bands is set forth, the package having a seal formed at offsetting marginal strips on the inner and outer plies of the multi-ply wall. In a preferred method of forming a package, a marginal strip on each ply is offset from an adjacent edge of the adjacent ply prior to forming the seal and the seal is formed by heat sealing the marginal strips to opposite edges of the same ply.

3,661,323

ODOR NEUTRALIZING DEVICE

Richard W. Farris, 1508 Indiana Avenue, La Porte, Ind.

Filed June 10, 1970, Ser. No. 44,997
Int. Cl. A61l 9/04
U.S. Cl. 236—93 17 Claims



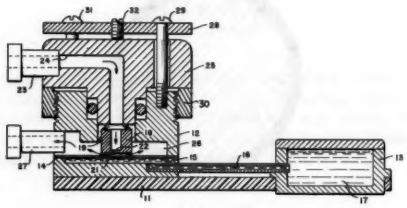
An odor neutralizing device for use with a heating and/or air conditioning system having an air return duct and a blower for use in a self-contained apparatus having an air passage with a fan or blower. The device includes a housing having an air inlet and an air discharge chamber and a container for the odor neutralizing material attached to the housing and communicating with the two chambers and forming an air passage therebetween. A thermostatically controlled valve senses the temperature of the air flowing through the chambers and varies the flow of air to maintain a substantially constant odor neutralizing vapor-to-air ratio regardless of air temperature.

3,661,324

TEMPERATURE SENSOR FOR SPACE SUIT

James B. Starr, St. Paul, Minn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 10, 1970, Ser. No. 96,874
Int. Cl. G05d 23/02
U.S. Cl. 236—98 3 Claims



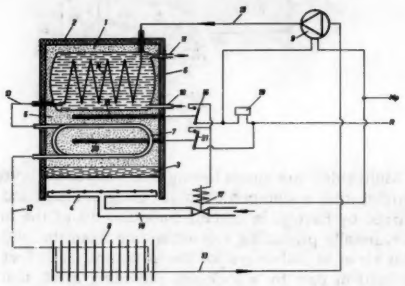
A temperature sensor having a liquid-filled temperature bulb for actuating a diaphragm which positions a hollow cylindrical valve plug. The hollow cylindrical valve plug is provided with an open end and a closed end having a small orifice therein whereby fluid flowing into said hollow cylindrical valve plug and out of said orifice provides a film of fluid between the closed end of the valve plug and the diaphragm thereby reducing sliding friction between the valve plug and the diaphragm.

3,661,325

VACUUM EVAPORATION TYPE WATER HEATER

Helmut Schmidt Auf Altenstadt, Remscheid-Reinshagen, Germany, assignor to Jon. Vaillant KG, Remscheid, Berghauser, Germany

Filed Oct. 19, 1970, Ser. No. 81,728
Claims priority, application Germany, Oct. 29, 1969, P 19 54 296.2
Int. Cl. F24d 3/08
U.S. Cl. 237—8 R 2 Claims



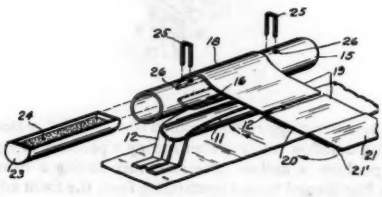
The service water boiler has a conduit for the space heating system extending through it and downstream from the boiler the conduit is exposed to the steam in the vacuum heating tank which also houses that boiler. The space heating thermostat switch is in series with a switch operated by a sensor in the tank with the two being arranged so that the gas to the burner heating the tank is shut off when a given temperature is reached at said sensor. A second sensor in the tank will, at a temperature lower than the given temperature, actuate a second switch also connected to shut off the gas to the burner provided that the thermostat switch is not calling for heat.

3,661,326

INSECTICIDE AND REPELLANT HOLDER FOR ATTACHMENT TO GARBAGE CAN LID

Milton A. Wilson, 12265 S.W. Webster, Seattle, Wash.

Filed Jan. 7, 1970, Ser. No. 1,129
Int. Cl. B05b 3/16
U.S. Cl. 239—60 1 Claim

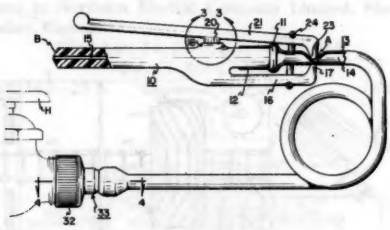


A tube of suitable size to lie snugly within the concave upper part of the handle on a garbage can lid is adapted to receive a boat shaped receptacle containing insecticide or repellant, the vapor or odor of which will tend to drive insects and animals away from the garbage can and a pliable tape is secured to the tube and used to attach the tube to the handle on the lid of the can.

3,661,327
LIQUID STORAGE AND DISPENSING DEVICE

Jordy Z. Adamson, 2932 Zenith Circle, Salt Lake City, Utah, and Charles B. Palmer, 580 North 750 West, Provo, Utah

Filed Apr. 7, 1970, Ser. No. 26,225
Int. Cl. B05b *1/30*
U.S. Cl. 239—569 6 Claims

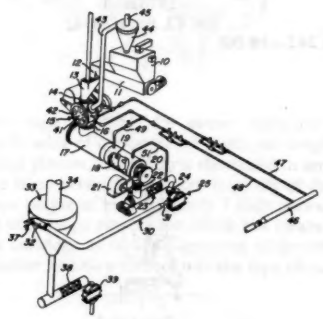


The present invention relates to portable devices for storing and intermittently dispensing liquid such as water. The device can be used as a child's toy, if desired. The rearmost portion of the device includes a one-piece, one-way valve that prevents the flow of contained liquid from the device when the same is charged preparatory to use. The elastomeric tubular storage member affixed to the one-way valve is expandable both longitudinally and radially in accordance with admission of liquid contents therein. The liquid charge is stored under pressure, by virtue of the elastomeric, resilient nature of the tubing, and is selectively released through the nozzle structure of the invention by intermittent hand pressure upon the actuating handle of the device. Such actuating handle is cradled or pivoted to a nozzle member constructed in a very simplified manner so as to minimize manufacturing and assembling costs.

3,661,328
PULP REFINING SYSTEM AND PROCESS

Raymond A. Leask, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Mar. 30, 1970, Ser. No. 23,592
Int. Cl. B02c *7/02*
U.S. Cl. 241—18 30 Claims

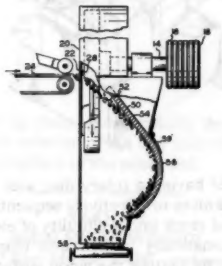


A unique system and process for producing an improved refiner groundwood from a great variety of raw fibrous material including both softwoods, hardwoods and their waste residuals, characterized by a multi-stage disc refining of the raw materials. The first stage refining is effected in a pressurized environment and features an absence of liquid except for that moisture embodied in the raw material per se in delivery to the refiner. The first stage refining is conducted under controlled conditions providing a moderate elevated pressure and subsequent disc refining is effected under atmospheric pressure conditions. The unique result is a bright fiber yield equal to that available in straight atmospheric refining. More importantly, the yield is achieved with a minimum of power. A most significant result of the invention process is an unexpected reduction in bulk of the fiber furnished.

3,661,329
MEANS AND METHOD FOR PRODUCING WOOD CHIPS

William C. Smith, and Wilfred Farnworth, both of Vancouver, British Columbia, Canada, assignors to Rader Pneumatics & Engineering Co. Ltd., Municipality of Burnaby, Canada

Continuation of application Ser. No. 782,585, Dec. 10, 1968, now abandoned. This application July 9, 1970, Ser. No. 56,173
Int. Cl. B27l *11/02*
U.S. Cl. 241—28 11 Claims

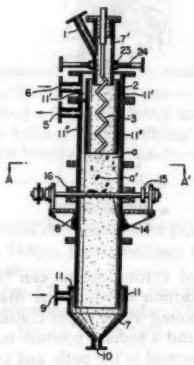


Rotary chipper for producing chips for pulp making is constructed to cause impact of chips from rotary disc cutter at angle such as to cause breakup of cards but minimizing production of pins and fines.

3,661,330
APPARATUS FOR DRYING POLYESTER PARTICLES

Seibi Yamada, and Yoshiharu Asada, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

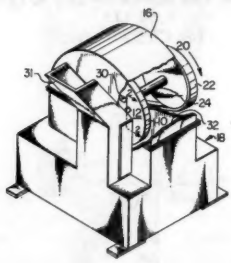
Filed Jan. 22, 1970, Ser. No. 10,679
Claims priority, application Japan, Aug. 23, 1967, 42/53755
Int. Cl. F26b *17/12, 17/22*
U.S. Cl. 241—65 10 Claims



Apparatus for drying polyester particles comprising the first zone of heating and crystallizing non-crystalline polyester particles which are packed in such a manner that they are movable downwards by their own weight, at tem-

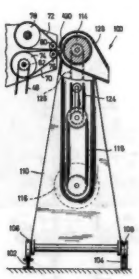
peratures ranging 120°–200° C., with mechanical agitation, until at least the surfaces of the particles are substantially crystallized, and the immediately succeeding zone of heating and drying the particles maintained under the packed state but without agitation, each zone having a separate hot air inlet with a common outlet therebetween.

3,661,331
WOOD CHIPPER
Earl Ballew, Route 2, P.O. Box 160, Blue Ridge, Ga.
Filed Sept. 8, 1969, Ser. No. 856,063
Int. Cl. B02c *18/06*
U.S. Cl. 241—92 **7 Claims**



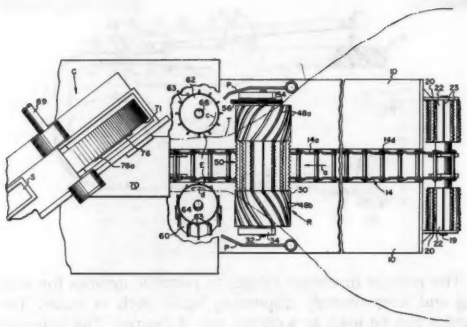
Wood chipper having a rotary disc with spirally mounted L-shaped wing knives to effectively sequentially slice the surface of the wood stock into a plurality of elongated segments which are automatically broken into chips, each segment being produced by cutting the wood surface simultaneously in multiple directions and at a predetermined depth. Thus, initial orientation of the bulk waste is unnecessary.

3,661,332
APPARATUS FOR GRANULATING SYNTHETIC MATERIAL
Rudolf Paul Fritsch, Stuttgart-Weilimdorf, Germany, assignor to C. F. Scheer & Cie, Stuttgart-Feuerbach, Germany
Filed Mar. 27, 1970, Ser. No. 23,329
Claims priority, application Germany, Mar. 29, 1969, P 19 16 219.7
Int. Cl. B02c *18/06*
U.S. Cl. 241—222 **10 Claims**



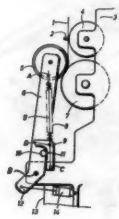
First and second cutting means can be shifted together between a first position in which the first cutting means is located in a path along which ropes consisting of a synthetic material are fed, and a second position in which the second cutting means is located in the path, and cuts the transported ropes. The respective other cutting means is available for servicing, and it is preferred that only the operating cutting means be driven by a motor, while the respective other cutting means, which is idle, is disconnected by a clutch from the motor.

3,661,333
TREE DESTROYER
Leward N. Smith, Remus, Mich., assignor to Morbark Industries, Inc., Winn, Mich.
Filed Jan. 22, 1971, Ser. No. 108,933
Int. Cl. B02c *18/06*; **B27l** *11/02*
U.S. Cl. 241—281 **44 Claims**



Tree destroying apparatus for reducing felled trees directly to chips comprising a log chipper for cutting the trunks and branches into chips, and apparatus for feeding the trees forwardly, trunk-first, toward the chipper, entrance opening including a tree supporting feed bed with a power driven conveyor, a generally laterally extending endlessly driven member above the feed bed cooperating with the conveyor to form a tree feeding drive nip, and upstanding laterally spaced limb and branch folding members positioned on opposite sides of the conveyor for folding the tree branches laterally toward the tree trunk.

3,661,334
DEVICE FOR REDUCING CONTACT PRESSURE OF A BOBBIN CONTACTING A DRIVE DRUM OF A THREAD WINDING ARRANGEMENT
Felix Graf, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland
Filed Oct. 14, 1969, Ser. No. 866,346
Claims priority, application Switzerland, Oct. 21, 1968, 15742/68
Int. Cl. B65h *54/42*
U.S. Cl. 242—18 DD **9 Claims**



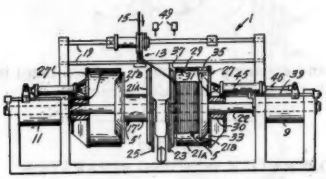
There is disclosed a device for reducing the contact pressure of a bobbin contacting a drive drum of a winding arrangement for threads or the like. The inventive device comprises a machine frame, a pivotable bobbin support arm and loading spring means cooperating with said bobbin support arm for providing the bobbin contact pressure. A lever is pivotably arranged on the machine frame and a guide element determines the position of said lever. According to an important aspect of the invention, the loading spring means is attached to the bobbin support arm in the vicinity of the bob-

bin and is hinged to the machine frame via the aforesaid lever, so that the guide element of the bobbin support arm deflects this lever and the loading spring means over a certain distance while the bobbin support arm is tilted.

3,661,335
ANTI-RICOCHET WIRE GUARD

John Joseph Stefaniszyn, Pointe Claire, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Apr. 24, 1970, Ser. No. 31,554
Int. Cl. B65h *54/02*
U.S. Cl. 242—25 A 6 Claims

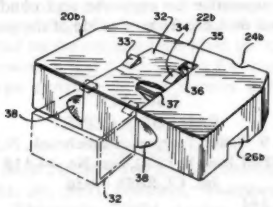


An apparatus for winding wire or rod on a reel having a shield, at least a portion of which is movable, to substantially enclose and protect wire wound on the reel when the wire is cut. A circumferential gap is provided between an edge of the shield and a flange of the reel through which the cut end of the wire can extend.

3,661,336
MINIATURE CARTRIDGE AND MEANS FOR INSTALLING AND REMOVING THE SAME

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 1, 1970, Ser. No. 33,633
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A 8 Claims



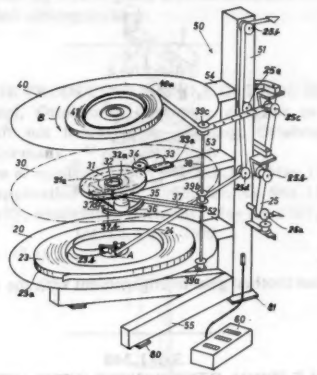
A miniature tape cartridge for stereo eight-track tape players with a housing of conventional width and height to fit pre-existing tape players, but which is shortened to terminate within a range from between anywhere inwardly of the front wall of the tape player to approximately 1 inch outwardly of the front wall of the tape player, and which has means extensible from the cartridge to facilitate grasping of the cartridge for removal and/or insertion thereof into the tape player.

3,661,337
SUPPLY AND TAKEUP SYSTEM FOR FILM AND THE LIKE

Willi Burth, Kaufmannein, Marienplatz 4, Ravensburg, Germany

Filed Nov. 5, 1969, Ser. No. 874,334
Claims priority, application Germany, Oct. 18, 1969, P 19 52 592.9
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 R 7 Claims

A reel system for film and the like includes a pair of film plates or disks mounted on respective horizontal arms of an upright support carrying a pair of turntables drivable by respective electric motors. A payout device is fixed in the

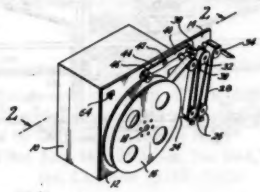


middle of one of the disks to controlledly draw the film continuously from the interior of the coil and/or to coil the film on the external periphery of the other disk.

3,661,338
HIGH SPEED WINDER

Paul E. Becking, San Mateo, Calif., assignor to Data-Link Corporation, San Mateo, Calif.

Filed Nov. 3, 1969, Ser. No. 873,378
Int. Cl. B65h *23/18, 25/32, 23/16*
U.S. Cl. 242—67.1 7 Claims



Tape winding apparatus including a motor-driven reel and means for stopping the reel in response to increased tension on the tape, including a tension control arm which is movable to control tape tension, and including automatic cut-off means when the tape breaks and when the reel is filled.

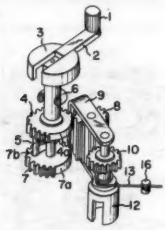
3,661,339
FILM REWINDING MECHANISM FOR CAMERAS

Terushige Shimizu, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 17, 1970, Ser. No. 20,327
Claims priority, application Japan, Mar. 27, 1969, 44/26698
Int. Cl. G03p *1/04*
U.S. Cl. 242—71.6 5 Claims

A film rewinding mechanism for underwater cameras comprises a rewinding shaft adapted to engage film rewind gearing for film rewinding and to disengage from the gearing during film advancement. The shaft is provided with two coaxial gears having areas formed without teeth. During film advancement, the areas without teeth are in alignment to disen-

gage the shaft from the rewind gearing; and during rewinding, the areas without teeth are out of alignment to form a continuous toothed gear in engagement with the rewind gearing.

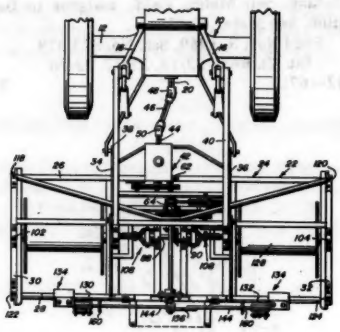


3,661,340

DOUBLE SPOOL WIRE WINDER WITH AUTOMATIC SPOOLING MECHANISM

Earl R. Trussell, Syracuse, Kans.

Filed Mar. 17, 1970, Ser. No. 20,168
Int. Cl. B65h *75/40*
U.S. Cl. 242—86.8 **6 Claims**



A support frame for support from a tractor hitch. The frame includes a rotatable transverse winding drum to be driven from a tractor power take-off and supported from the frame for easy removal therefrom. The frame further includes spooling guide structure for guiding wire being wound on the winding drum and the spooling guide structure includes structural features which enable it to be rendered inoperative and stored in an out-of-the-way position when it is desired to unwind wire from the drum.

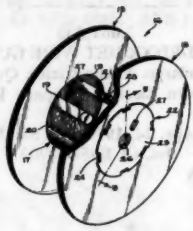
3,661,341

COLLAPSIBLE REEL

Stephen L. Elfrid, 641-61st Place, La Grange, Ill.

Filed Nov. 24, 1969, Ser. No. 879,211
Int. Cl. B65h *75/22, 75/14*
U.S. Cl. 242—115 **12 Claims**

A reel for wire, rope, or similar materials having two rigid flat flanges spaced apart in parallel planes normal to a common axis and connected at angularly spaced points around the axis by a plurality of elongated fingers which are formed of a foldable or flexible material permitting movement of the flanges toward each other and which are of a length correlated with the length of an axially rigid spacer surrounding the fingers and engaging the flanges to hold them in spaced relation while the fingers are under tension.

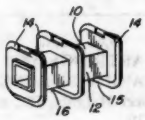


3,661,342

OPERATIVE WINDING SEPARATOR

Charles K. Sears, Chicago, Ill., assignor to Jackson Controls Company, Inc., Chicago, Ill.

Filed Aug. 19, 1970, Ser. No. 64,995
Int. Cl. B65h *75/14;* **H01f** *27/30*
U.S. Cl. 242—118.41 **12 Claims**



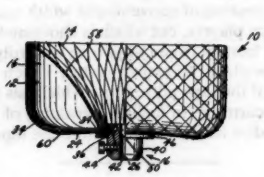
A partition mountable on a core to form winding spaces on a bobbin, the partition having a plurality of coacting surfaces cooperatively operative to captivate and conduct a strand being wound on the core from one side of the partition to the other.

3,661,343

PAD FOR A CONE

Jakier Barski, 9 Weller Terrace, Saddlebrook, N.J.

Filed June 8, 1970, Ser. No. 44,118
Int. Cl. B65h *49/36*
U.S. Cl. 242—141 **9 Claims**



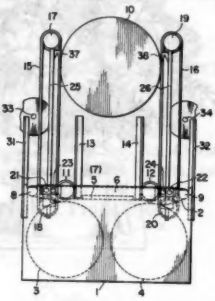
A pad for a yarn cone to catch unravelled yarn in excess of that required by the knitting machine. An open cylindrical frame is closed at one end, the end having a central aperture. An elastic mesh netting is placed over the frame, being retained by sleeve means in the aperture. The pad is positioned beneath the cone on the support rod. The stretched net inside the frame forms a soft, resilient, yet firm surface to catch yarn unravelling due to inertial forces from sudden stops or slowdowns on the yarn fed into the knitting machine.

3,661,344

MAGNETIC RECORDING AND REPRODUCING DEVICE

Takahiro Nakamura, Neyagawa; Osahiko Yano, Kadoma, and Hideki Sakumoto, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 18, 1970, Ser. No. 38,359
Claims priority, application Japan, May 24, 1969, 44-40299; 44-40300; 44-40301; 44-40302; 44-40303; 44-40304
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—199 4 Claims



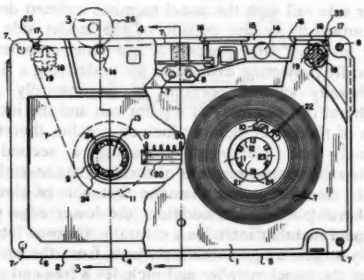
A magnetic recording and reproducing device of the cartridge loading type utilizing for its operation a movement of the magnetic tape magazine in which a magnetic tape is wound on a reel at the time the cartridge is inserted in and removed from the device. Specifically, a video tape recorder adapted to be mounted with a tape magazine has a mechanism for drawing the tape out of the tape magazine and for bringing the tape into contact with a tape guide provided with a rotary magnetic head or with a stationary magnetic head in response to the movement of the tape magazine when it is inserted in the magnetic tape recorder, a mechanism for removing the magnetic tape from the tape guide, stationary magnetic head or the like and returning it into the magazine in response to the movement of the tape magazine when it is removed from the recorder, a mechanism for bringing the tape out of contact with the tape guide, stationary magnetic head or the like for reducing the friction exerted on the running tape when the tape is fast forwarded or rewound, and a mechanism for making it easy to insert the tape cartridge in and remove it from the tape recorder.

3,661,345

HUB TO HUB TAPE CARTRIDGE

Theodore Ritz, Jr., 3691 Whitfield, Waterford, Mich., and Joseph M. Richtarcik, 20021 Avalon, St. Clair Shores, Mich.

Filed May 15, 1968, Ser. No. 729,469
Int. Cl. G11b *23/08*; B65h *75/28*
U.S. Cl. 242—199 5 Claims



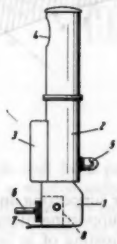
A hub to hub tape cartridge is disclosed comprising a housing having a component having locator pin apertures therein used in assembly of said cartridge; and a hub having a particular construction of tape lock means thereon; said component having male and female cross posts which mate without locking in a sliding fit to form a pair of spaced apart corner-turning posts for guiding the moving tape; said component also having an integrally formed solid and continuous thinned walled viewing section.

3,661,346

DEVICE FOR PRODUCING MISSILE GUIDING SIGNALS

Arnold Stangl, Ottobrunn, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

Continuation of application Ser. No. 729,215, May 15, 1968. This application Oct. 10, 1969, Ser. No. 866,139
Claims priority, application Germany, May 23, 1967, B 92667
Int. Cl. F41g *7/00*
U.S. Cl. 244—3.16 2 Claims



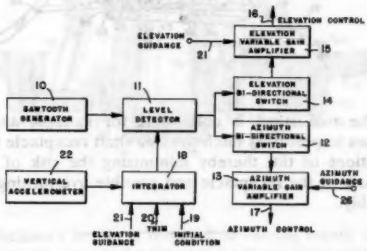
A device for producing signals for guiding a jet-propelled missile includes a periscope associated with an infrared goniometer, the periscope having an eyepiece and being mounted on a support plate. A hand lever is provided for manual guidance of the missile in the event that infrared guidance is ineffective and is positioned to extend in the direction of the line of sight of the periscope. This handle is positioned above the support plate of the periscope and on the side of the periscope opposite that having the eyepiece, for easy and comfortable operation by an operator.

3,661,347

GAIN CHANGER

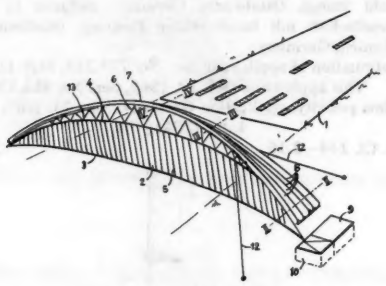
William H. Woodworth, and Jack A. Crawford, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 16, 1969, Ser. No. 844,732
Int. Cl. B64c *13/50, 15/00*
U.S. Cl. 244—77 D 3 Claims



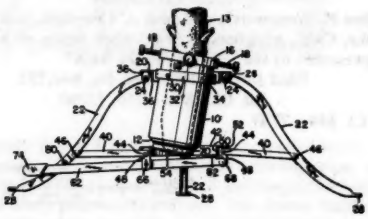
A device for adjusting the gain of the amplifier which drives the control surfaces of an aerodynamic vehicle to compensate for changes in lateral acceleration of the vehicle wherein the acceleration component of the commanded guidance is compared to the measured acceleration normal to the longitudinal axis of the vehicle. If the commanded acceleration is higher than that measured, the gain of the variable gain amplifier which drives the control surfaces of the aerodynamic vehicle is increased.

3,661,348
SUPPORTING MEANS FOR ELEVATABLE AIRCRAFT NET BARRIERS
Leif Mathias Borehag, Norrkoping, Sweden, assignor to Borgs Fabriks AB, Norrkoping, Sweden
Filed Nov. 5, 1970, Ser. No. 87,099
Claims priority, application Sweden, Nov. 14, 1969, 15,626/69
Int. Cl. B64c *25/68*
U.S. Cl. 244—110 C **8 Claims**



An arrangement for supporting an elevatable aircraft barrier net comprising a supporting means consisting of a convex arcuate structure consisting of at least one or more inflated gas or air-filled tubes to which a barrier net is attached, the tubes when inflated raising into an arcuate support for the net, causing the central portion of the net, or that part which is contacted by the aircraft, to be brought to a position where it is then the highest portion of the net.

3,661,349
ADJUSTABLE CHRISTMAS TREE STAND
Robert W. De Vries, Grand Rapids, Mich., assignor to Wolverine Industries, Inc., Grand Rapids, Mich.
Filed Mar. 30, 1970, Ser. No. 23,685
Int. Cl. A47g *33/12*
U.S. Cl. 248—46 **17 Claims**



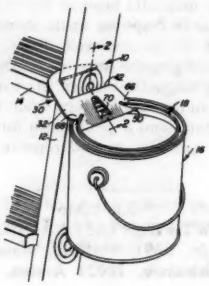
The tree stand is collapsible for storage, and includes means to positively latch the tree shaft receptacle in adjusted positions of tilt, thereby minimizing the risk of accidental release of the receptacle and possible overturning of the assembly.

3,661,350
FLORAL CARRIER
Richard C. Eckler, Wayland, Mass., and Frank H. Amirault, Lynn, Mass., assignors to Fredrick Brasco, Weston, Mass.
Filed Mar. 19, 1970, Ser. No. 20,997
Int. Cl. A47g *7/00*
U.S. Cl. 248—146 **5 Claims**

A carrier designed for accepting a wide variety of vases employed in the floral trade is conveniently formed from plastic. The carrier configuration provides for ready adaptation to a wide range of vase sizes and shapes and prevents tipping during transportation and delivery of floral arrangements. Two general types of carriers are disclosed, a first

type being used generally for most shapes and sizes of floral vase, and the other type being employed specially for a class of irregular shapes, such as for bulky oblong or rectangular vases.

3,661,351
LADDER MOUNTED PAINT PAIL SUPPORT
Olaf L. Olsen, 5325 116th Avenue, N.E., Kirkland, Wash.
Filed Dec. 23, 1969, Ser. No. 887,633
Int. Cl. E06c *7/14*
U.S. Cl. 248—210 **3 Claims**



An inclined panel member including a hook at its upper end for embracingly engaging and canting relative to the side rail of a ladder for support of the panel member from the ladder side rail with the panel member inclined downwardly and outwardly to the outside of the ladder side rail. The lower marginal edge portion of the panel member includes outwardly projecting extensions for underlying a first pair of peripherally spaced portions of an inwardly projecting peripheral rim assembly of a paint can and the inclined side edges of the panel member include notches therein for embracingly and clampingly engaging a second pair of peripherally spaced portions of the cam rim assembly spaced slightly closer together than the first pair of rim assembly peripheral portions. In addition, the lower edge portion of the panel member includes a centrally disposed laterally outwardly struck tongue which projects from the undersurface side of the panel member and includes a free end portion for underlying still another portion of the peripheral rim assembly of the paint can spaced centrally intermediate both

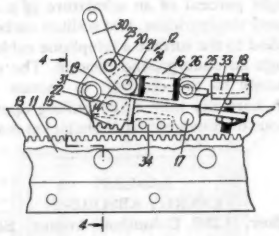
the first and second pairs of peripherally spaced portions of the rim assembly of the can. In addition to providing a means for suspending a paint can from a ladder side rail, the panel member also functions as an inclined drain surface for draining paint clinging to a brush may be wiped to remove excess paint and the horizontally opening upper hook portion of the panel member defines a support from which a paint brush may be supported when the can is not being supported from a ladder, the handle portion of the paint brush being received through the hook and canted relative thereto with the bristles of the brush disposed over the top of the associated can.

3,661,352

ADJUSTABLE SLIDE MEMBERS, ESPECIALLY TO ACCOMODATE VEHICLE SEAT TRAVEL

Arthur Herbert McFarlane, Basildon, England, assignor to Teleflex Limited, Basildon, Essex, England

Filed June 4, 1970, Ser. No. 43,480
Claims priority, application Great Britain, July 10, 1969, 34,872/69
Int. Cl. F16m *13/00*
U.S. Cl. 248—429 **10 Claims**



An improved locking device comprising two assemblies relatively slidable with respect to each other, one of said assemblies having a support means extending in the direction of relative sliding and having thereon a first position holding means, the other of said assemblies having thereon a second position holding means for operative engagement with said first position holding means and biasing means attached to a toggle link means, said toggle link means being connected to said second position holding means for shifting it into and out of engagement with said first position holding means.

3,661,353

TRAY HAVING CONTAINERS FOR FORMING ICE CUBES AND THE LIKE

Robert Newsteder, W. Orange, N.J., assignor to Monogram Ice Company, Inc., Orange, N.J.

Filed Aug. 24, 1970, Ser. No. 66,425
Int. Cl. B41b *11/62*
U.S. Cl. 249—103 **2 Claims**

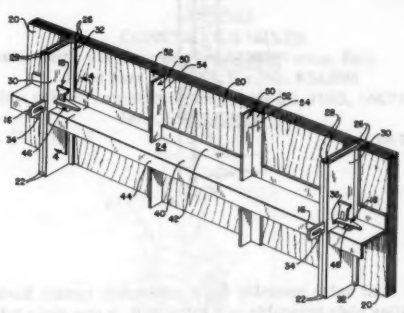
A tray having a plurality of apertures with containers disposed therein. The containers include a rim with a well depending therefrom which is shaped to form letters of the alphabet. The well sides each have a draft and locking means are on each container for selectively locking it into its respective aperture. The bottom of the containers are in a common plane and can all be placed in direct contact with a cooling surface.

3,661,354

REINFORCED CONCRETE WALL FORM PANEL

Richart T. Dagiel, Elk Grove Village, and David L. Cody, Hoffman Estates, both of Ill., assignors to Symons Corporation, Des Plaines, Ill.

Filed July 13, 1970, Ser. No. 54,501
Int. Cl. E04g *11/06*
U.S. Cl. 249—192 **8 Claims**



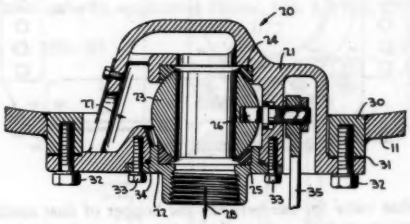
A reinforced concrete wall form panel of the "Steel-Ply" type and consisting of a steel-studded rectangular plywood facing which is reinforced by horizontally disposed, vertically, spaced, transverse crossbars which define included openings therebetween. Additional vertically disposed, horizontally spaced, longitudinal backbone members extend the full length of the panel, intersect the transverse crossbars, extend across the included openings and provide a plate action which limits the deflection of the plywood facing to substantially the deflection of such crossbars, while at the same time preventing rotation of the crossbars.

3,661,355

INTERNAL BALL VALVE

William W. Rawstron, Northboro, Mass., and Edwin S. Carlson, Chicago, Ill., assignors to Jamesbury Corporation, Worcester, Mass., by said Rawstron

Filed Feb. 2, 1967, Ser. No. 629,043
Int. Cl. F16k *5/06;* **B60p** *3/22*
U.S. Cl. 251—144 **6 Claims**



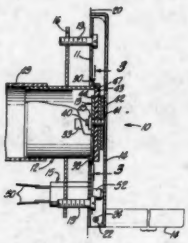
The disclosure herein is directed to valving means of the type commonly used in highway and railway tank cars. The operating mechanism of the valve is positioned within the tank with only the actuator of the valve projecting beyond the tank surface. Accordingly, in the event of a wreck or the like, the valve will not be damaged. The valve, comprising a ball positioned in a body portion between a pair of resilient lip seals, is conveniently actuated from a side thereof or from the bottom by means of a valve stem which is in engagement with the ball of the valve.

3,661,356

INLET VALVE ASSEMBLY FOR PNEUMATIC SYSTEM

Council A. Tucker, Glendale, Calif., assignor to Natter Manufacturing Corporation, Temple City, Calif.

Filed Feb. 9, 1970, Ser. No. 9,892
Int. Cl. F16k 1/16; F16l 5/00
U.S. Cl. 251—299 9 Claims



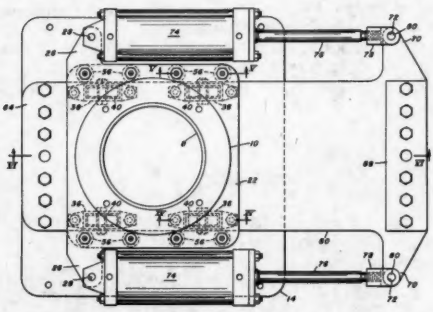
An inlet valve assembly for a pneumatic system having a mounting plate securable to a room wall. A one piece tubular inlet member is provided with integral keeper means for holding it detachably assembled to the mounting plate and provides a valve seat for a valve member mounted on the inner side of a pivoting cover plate for the assembly. A concealed control switch for the pneumatic system is operated automatically by opening and closing the cover plate.

3,661,357

DUST VALVE

Floyd Armstrong, Jr., Gary, Ind., assignor to United States Steel Corporation

Filed June 1, 1970, Ser. No. 42,170
Int. Cl. F16k 3/16, 25/00
U.S. Cl. 251—62 11 Claims



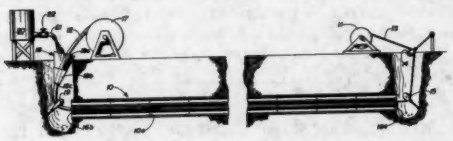
A dust valve for use between the hopper of dust catching equipment and the dust disposable system includes two spaced plates having a slide plate therebetween. The slide plate has an opening which is movable into and out of alignment with the dust conveying conduits. The opening walls are so shaped as to provide a shearing action across the bottom of the top plate to prevent or lessen dust build up. The height of the space is greater than the thickness of the slide plate which is held against the bottom of the top plate by means of spring biased rollers extending into the space. The longitudinal edges of the slide plate are in contact with roller guides. The slide plate is actuated by means of two air cylinders having their piston rods attached to opposite sides of the slide plate.

3,661,358

CABLE PULLING METHOD

Marcus J. Dill, Dallas, Tex., assignor to The Western Company of North America, Fort Worth, Tex.

Filed Oct. 13, 1969, Ser. No. 865,648
Int. Cl. E21c 29/16
U.S. Cl. 254—134.3 R 9 Claims



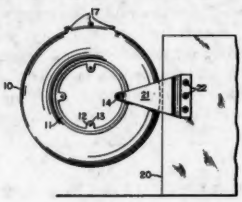
Elongated objects such as cables, wire, and the like, are passed through relatively tight-fitting tubular members by initially applying an aqueous mixture of a particulate hydratable polymer having a molecular weight of at least about 200,000 to each elongated object and thereafter passing the object through the tubular member by means of a pulling line. For example, an aqueous slurry containing from about 0.5 to about 4 weight percent of an admixture of a copolymer of acrylamide and vinylpyridine, and sodium carboxymethylcellulose is applied to the surface a telephone cable as it is being pulled through an underground conduit. The slurry will adhere tenaciously to the conduit, to reduce the frictional forces which normally inhibit the pulling operation, and is non-deleterious to conventional cable jacket material.

3,661,359

ENERGY ABSORBER

Brooks Walker, 1280 Columbus Avenue, San Francisco, Calif.

Filed Jan. 12, 1970, Ser. No. 2,327
Int. Cl. E01f 15/00
U.S. Cl. 256—1 8 Claims



The object of this invention is to form an energy absorber of used auto tires and rims mounted so as to receive the impact on the tire tread and collapse the rim with enough energy, the tires to be filled with liquid with holes and blow-out plugs, the rims and plugs to be cheap enough to be thrown away after a serious accident.

3,661,360

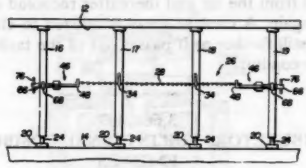
STRESSED CHAIN FENCE

Edward F. Windham, Fort Lauderdale, Fla., assignor to General Safety Inc., Ft. Lauderdale, Fla.

Filed Nov. 12, 1970, Ser. No. 88,844
Int. Cl. E04h 17/02
U.S. Cl. 256—37 4 Claims

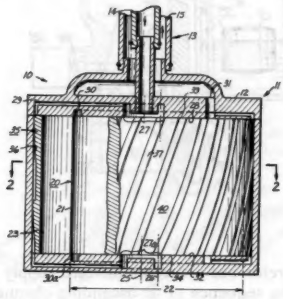
A tightening arrangement for a chain adapted to be strung rigidly between adjoining pluralities of post members; a screw type tightening device is attached to the first and last of the plurality of post members which have bracket means to which the ends of the chain can be releasable attached so that when the screw type tightening means are turned the chain is drawn in opposite direction to tighten the chain; the

intermediate post members between the end posts are each provided with a hook for hooking attachment of said chain



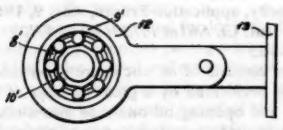
thereto between adjoining chain links; the intermediate hook members on the intermediate posts are pivotable to permit take-up of any slack in the chain between adjoining posts.

3,661,361
FLUID-ACTUATED VIBRATOR WITH HELICALLY-SHAPED FLUID PASSAGEWAYS
George Lester Malan, 560 East Rowland, Covina, Calif.
Filed Sept. 18, 1970, Ser. No. 73,409
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 R **4 Claims**



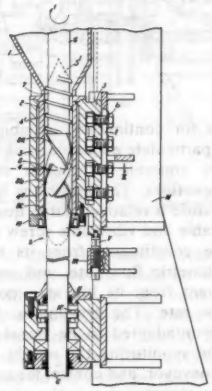
A free-rotor vibrator of the class which includes an outer case containing an internal cylindrical race wherein there orbits a free rotor of lesser diameter. Actuating fluid at relatively high pressure and exhaust fluid at relatively low pressure are respectively supplied to the rotor and exhausted therefrom simultaneously at both ends thereof in order to provide power for the orbital propulsion of the rotor. This is accomplished by providing helically-shaped passages between the race and the case, whereby the radical centrifugal forces of the rotor are resisted by helically-shaped separators, there always being at least one which resists the cantilever-type flexure of the race between the separators.

3,661,362
ROTARY VIBRATOR
Peder Ulrik Poulsen, Lonholt Ladegaard 3480 Fredensborg, Lyngby, Denmark
Filed Dec. 9, 1969, Ser. No. 883,434
Claims priority, application Denmark, Dec. 10, 1968, 6047
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 R **9 Claims**



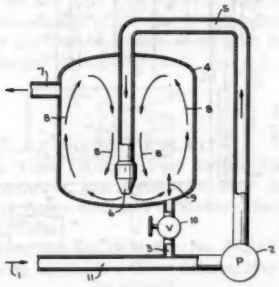
A rotary vibrator in which energy from a rotating shaft is converted to mechanical vibrations between a rotor member and a stator member, one of which is formed as a prism the cross-section of which is a regular polygon with rounded vertices while the other is provided with a plurality of balls or rolls axially parallel to the prism, retained in such relative positions that they are positioned at the vertices of a regular polygon the face number of which differs from the face number of the prism, preferably by one.

3,661,363
CONTINUOUS MIXER
Renato Aletti, Via Sempione 14, 21100 Varese, Italy
Filed May 15, 1969, Ser. No. 824,995
Claims priority, application Italy, May 18, 1968, 16671 A/68
Int. Cl. B01f *7/24, 7/08*
U.S. Cl. 259—7 **10 Claims**



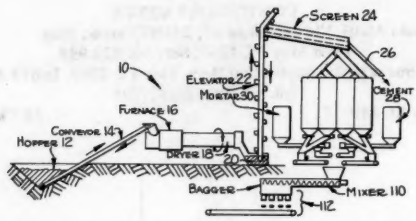
A mixer for use particularly in the dispersion of powders in gelatinous masses and for the handling of the resultant mixtures, applicable especially to the rubber and plastics industries in general, in which a single mixing chamber is used together with a single rotor consisting of a number of sections inside said chamber.

3,661,364
DEVICE FOR CONTINUOUS MIXING OF MATERIALS
Jaime Richard Lage, Umiken, Switzerland, assignor to F. Barry Haskett, Versoix, Geneva, Switzerland
Filed Jan. 31, 1969, Ser. No. 795,529
Claims priority, application France, Feb. 2, 1968, 139497
Int. Cl. B01f *5/12*
U.S. Cl. 259—95 **2 Claims**



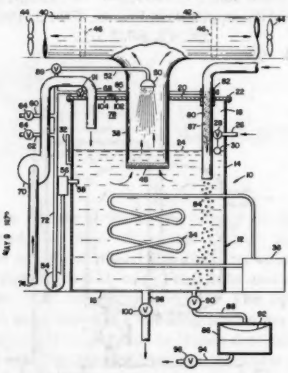
A method and a device for the continuous mixing of at least two materials of which one can be pumped and providing a tank for the mixing process in which the material to be mixed is caused to circulate by means of a feed pump.

3,661,365
APPARATUS FOR PROPORTIONING DRY PARTICULATE MATERIALS
Fayette J. Cloud, Jr., Lilesville, N.C., assignor to W. R. Bonsal Company, Lilesville, N.C.
Filed Nov. 30, 1970, Ser. No. 93,539
Int. Cl. B28c *7/04*
U.S. Cl. 259—154 **10 Claims**



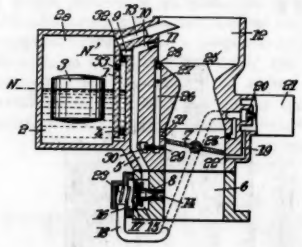
An apparatus for continuously combining and mixing a plurality of dry particulate materials, such as the various constituents in dry concrete or mortar mixes, in accurate preselected proportions. The apparatus includes a separate bin adapted to store a relatively large quantity of each constituent, a rotatable and vibratable screw conveyor for feeding one of the constituents from its bin at a constant preselected volumetric flow rate, and means for feeding a second constituent from its bin at a constant preselected gravimetric flow rate. The gravimetric feeding means includes a conveyor adapted to be translated at a constant speed, means for monitoring the weight of the constituent carried on the conveyor, and control means to adjust the rate of delivery of the constituent onto the conveyor to maintain a substantially constant weight thereof on the conveyor.

3,661,366
FLUID CLEANING AND COOLING APPARATUS AND METHOD
Cletus W. Shinkle, 600 Lewis Road, Santa Rosa, Calif.
Continuation of application Ser. No. 734,772, June 5, 1968, now abandoned. This application Mar. 1, 1971, Ser. No. 120,038
Int. Cl. B01d *47/02*
U.S. Cl. 261—5 **12 Claims**



Apparatus and method for cleaning and cooling a fluid, such as ambient air, wherein a tank adapted to contain a coolant, such as water or the like, is provided with an air inlet conduit and an air discharge conduit, whereby air to be cleaned and cooled is directed into the tank through a portion of the coolant, and then outwardly of the tank. During the time the fluid passes through the tank, it is cleaned and cooled and, if the fluid is solvent-laden air, the solvent is separated from the air and thereafter recooled so that it can be used again. A coolant spray is utilized to clean and cool the fluid still further as it passes out of the tank through the discharge conduit.

3,661,367
CARBURETORS FOR INTERNAL COMBUSTION ENGINES
Andre Louis Mennesson, Neuilly-sur-Seine, France, assignor to Societe Industrielle De Brevets Et D'Etudes S.I.B.E., Neuilly-sur-Seine, France
Filed Apr. 7, 1971, Ser. No. 131,940
Claims priority, application France, Apr. 17, 1970, 7014054
Int. Cl. F02m *7/22*
U.S. Cl. 261—41 D **1 Claim**

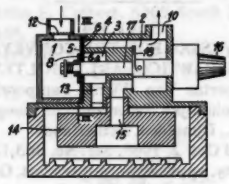


The carburetor has a fuel/air mixture supply circuit constituted by the sequence of an ascending channel connected to a float chamber through an immersed calibrated orifice and a descending channel with an opening into the intake pipe of the carburetor downstream of the main throttle member of this pipe. The descending channel is controlled by a member which opens it only during periods of deceleration of the engine. The linking zone between the two channels is above the constant level of the float chamber and connected through an air passage having a second calibrated orifice, to an air intake zone of the carburetor other than that connected to the upper portion of the float chamber. The ascending channel has a further calibrated orifice above the constant level and communicates with the space above the constant level through a passage of small cross-section opening into the ascending channel between its two calibrated orifices and also itself above the constant level. The assembly reduces the suction in the ascending channel to an extent insufficient or sufficient to stop the fuel being sucked into the descending channel according as the closure member is open or not.

3,661,368
GASEOUS FLUX DISTRIBUTOR
Robert Metivier, 49 rue du Docteur Blanche, Paris, France
Filed Aug. 4, 1969, Ser. No. 847,352
Claims priority, application France, Aug. 9, 1969, 162554
Int. Cl. A61m *17/00;* **B01d** *47/02*
U.S. Cl. 261—63 **2 Claims**

This device consists of an enclosure subdivided internally by a partition perforated by a great number of holes having parallel axes and opening on one side into a single chamber and on the other side into two separate chambers by a longitudinal partition. A suitable shutter permits of covering in said single chamber holes corresponding to one of said

separated chambers and at the same time uncovering the equivalent number of holes opening into the chamber 3 for

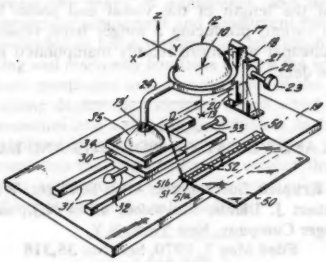


the purpose of varying the proportion of the outputs of the two fluxes.

3,661,369
HEATING APPARATUS HAVING SIMPLIFIED FOCUSSING MEANS

Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Inc., Hopewell, N.J.

Filed May 1, 1970, Ser. No. 33,725
Int. Cl. F27b *9/14, 3/06*
U.S. Cl. 263—2 R **17 Claims**



Heating apparatus including a radiation source and reflector means for focussing reflected rays at an image focus. The source of radiant energy and reflector means are mounted upon an adjustable support which is linearly movable in a vertical direction to position a heating apparatus above a working surface.

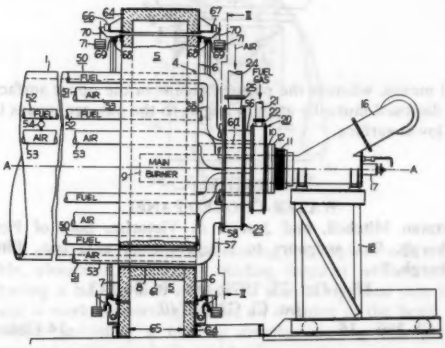
The working surface is comprised of means movable in two mutually perpendicular directions within a plane perpendicular to the direction of movement of said heating apparatus. Said means is further adapted to receive and support the object to be heated. Indicator means located outside of the heating area, is coupled to the heating apparatus and includes pointer means adaptable to be positioned immediately above the region of the object to be heated. The support assembly is initially moved to a first position. The object to be heated is placed upon the supporting means which, together with the eating apparatus is adjusted to place the indicator so as to rest upon the object to be heated. After adjustment, the supporting apparatus is then moved to a second working position whereby the adjustments previously made rapidly and accurately locate the object to be heated exactly in the focal image of the reflector means.

Further means may be provided for locking the supporting surface in position to prevent its jarring when moved into the working position. Also, novel reflector means may be provided for projecting the object being heated upon a screen for viewing purposes to accurately control the level of heating required whereby the radiation employed for heating is utilized as the illuminating source for the projection apparatus.

3,661,370
GAS DELIVERY MANIFOLD AND PROCESSED MATERIAL DISCHARGE ASSEMBLY FOR ROTARY KILN

Eugene F. Rossi, Wauwatosa, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 24, 1970, Ser. No. 101,282
Int. Cl. F27b *7/00*
U.S. Cl. 263—33 R **8 Claims**



A rotary kiln is disclosed with a rotary firing hood mounted concentrically over the material discharge end of the kiln to rotate with the kiln. A main burner assembly projects axially through a neck formed by a rear wall of the hood and a plurality of burners project radially through the kiln shell. Fuel gas conducting tubes for supplying the kiln shell burners, are mounted on the outer periphery of the kiln shell and extend axially through the hood and rear wall thereof. The fuel tubes each have portions that project radially inward along an outer surface of the hood rear wall and axially away from the rear wall to an annular fuel gas manifold box mounted close around the hood rear wall neck. The annular manifold box has a pair of axially spaced radial walls connected to rotate with the rotary hood and a nonrotating outer sleeve connected to a stationary fuel gas delivery conduit. An annular air manifold box, similar in construction to the fuel gas manifold box, is mounted close around the axially extending portions of the fuel tubes and between the fuel gas manifold box and the rear wall of the firing hood. Air conducting tubes mounted on the kiln shell also extend axially through the rotary hood and rear wall thereof and have portions which project radially inward and axially away from the rear wall to the annular air manifold box. The kiln is provided with a pair of radial discharge ports, circumferentially spaced 180° apart, for discharging processed material twice each revolution of the kiln. The air and fuel gas tubes are arranged along the kiln shell in two groups, with each group of tubes being on one side of the kiln and between the pair of kiln discharge ports to be spaced away from hot processed material discharged through the ports.

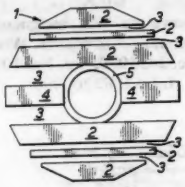
3,661,371
CONVECTOR PLATES

Leslie George Victor Skelton, Port Talbot; Godfrey Hunt Thomas, Porthcawl, and Hedley Brynmor Jenkins, Port Talbot, all of Wales, assignors to Skelton-Thomas Limited, Port Talbot, Wales

Filed May 12, 1970, Ser. No. 36,559
Claims priority, application Great Britain, May 13, 1969, 24,379/69
Int. Cl. C21d *1/00*
U.S. Cl. 266—5 R **6 Claims**

A convector plate for use in heat treatment furnaces comprising a plate of substantially circular configuration with an upper and lower surface each of which includes a plurality of

gas passage means of channel section, the passage means in one face being mutually parallel and each means in one face being mutually parallel and each having substantially parallel



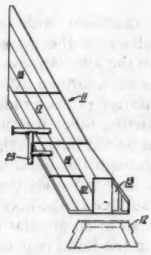
wall means, wherein the passage means in the upper surface are disposed mutually at right angles to the passage means in the lower surface.

3,661,372

WATER-COOLED PANEL

Hartman Mitchell, and Joseph A. Vietorisz, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 27, 1970, Ser. No. 84,343
Int. Cl. C21c *5/40*
U.S. Cl. 266—15 **14 Claims**



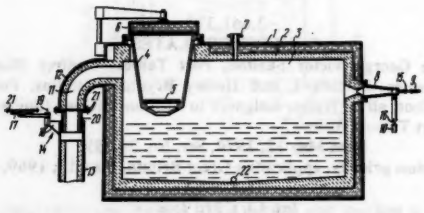
A hollow panel through which cooling water flows comprises a rectangular box having one undulating surface that is exposed to heat, such as the heat of exhaust gases from a BOF converter.

3,661,373

APPARATUS FOR FILTRATION OF MOLTEN METALS AND ALLOYS CONTAINING A SOLID PHASE

Vasily Mikhailovich Cheltsov, prospekt Kosmonavtov, 38, korpus 2, kv. 92; Sergei Petrovich Kosarev, Nalichnaya ulitsa, 39, korpus I, kv. 20, and Nina Voldemarovna Didrikh, Moskovsky prospekt, 220, kv. 26, all of Leningrad, U.S.S.R.

Filed Aug. 28, 1970, Ser. No. 67,788
Int. Cl. C21c *7/00*
U.S. Cl. 266—34 T **2 Claims**



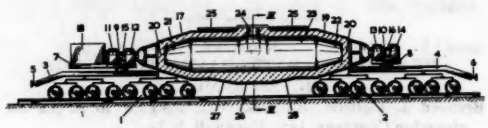
An apparatus is proposed for filtration of molten metals and alloys characterized in that the metal collector of the apparatus is made in the form of a hermetically sealed lined chamber provided an internal gas heating system and with a device for removing the products of combustion.

3,661,374

CAR WITH A VESSEL FOR THE CONVEYING OF HOT SUBSTANCES, PARTICULARLY MOLTEN PIG IRON

Wilhelmus Lambertus Van Wierst, Santpoort, Netherlands, assignor to Koninklijke Nederlandsche Hoogovens En Staal Fabrieken N.V., Djmuiden, Netherlands

Filed Oct. 2, 1969, Ser. No. 863,182
Claims priority, application Netherlands, Oct. 7, 1968, 6814343
Int. Cl. C21c *1/06*
U.S. Cl. 266—39 **6 Claims**



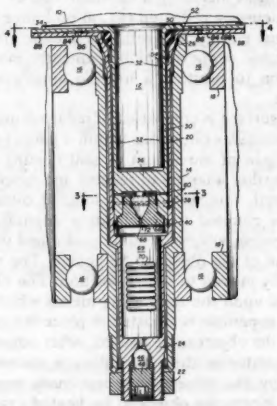
The refractory lined vessel is elongated and carried by wheeled bogies to be tiltable about a horizontal axis, and includes the improvements, severally and in various combinations, that the vessel shell is bulged and the lining is thickened opposite the opening, preferably over at least 40 percent of the length of the vessel and about half of its peripheral extent, producing a longer lived vessel and one which is cheaper and more readily manipulated in respects set forth in detail.

3,661,375

SHOCK AND VIBRATION ISOLATOR AND DAMPING SYSTEM

Walter J. Krupick, Succasunna; Allan B. Pilger, W. Caldwell, and Robert J. Dickie, Maywood, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 7, 1970, Ser. No. 35,318
Int. Cl. F16f *15/10*
U.S. Cl. 267—137 **17 Claims**



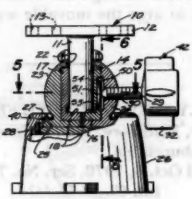
A system for connecting between two members to provide isolation and damping of relative movement between the members, the system including a pair of spaced telescoped coupling sleeves respectively secured to said members. A damping means is disposed in the space between the sleeves, and an effective spring resistance to radial and axial movement is provided between the sleeves.

3,661,376

SUPPORT HAVING THREE AXES OF ADJUSTMENT AND A SINGLE LOCKING HANDLE

Dwight A. Hill, 1740 Huntington Drive, South Pasadena, Calif., and Otto F. Colbert, 6309 South Pickering Avenue, Whittier, Calif.

Filed Apr. 9, 1970, Ser. No. 27,039
Int. Cl. B23q 1/04
U.S. Cl. 269—75 10 Claims



A work support device has a base structure, a split carrier rotatably mounted on the base structure, a post, and a split bushing for releasably receiving the post and for selectively gripping the post. The split bushing is mounted within the split carrier for turning movement about an axis, and the split carrier, the split bushing and the post are selectively arrestable and subsequently releasable upon actuation of a single clamp device.

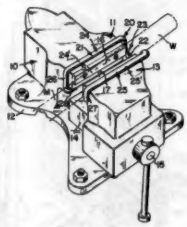
To increase the range of adjustment, and decrease the requisite power for adjustment and adjustment friction, a leaf spring is provided in force transmitting relationship with the split bushing and resiliently bendable toward the split bushing at the above mentioned axis of movement of the split bushing. The clamp device then includes a bolt which has a certain cross-section and a tip portion which is in force transmitting relationship with the leaf spring within an area of force transmission that is several times smaller than the bolt cross-section and that has a center located substantially on the axis of movement of the split bushing.

3,661,377

WORK BRACE FOR VICE

John D. Fuller, 1044 Laurent Street, Santa Cruz, Calif.

Filed Nov. 16, 1970, Ser. No. 89,618
Int. Cl. B25b 1/24
U.S. Cl. 269—88 4 Claims



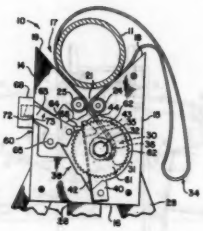
A work brace vice attachment for a custom jeweler's mandril and the like for achieving a three point support for such mandril between the jaws of such vice and on a sling under the working end of the mandril and consisting of a U shaped sling having leg portions adapted to overly the respective jaws of the vice and end portions cooperating with the sling for embracing the vice jaws such that one leg portion serves as an attaching means for attaching the brace to the fixed jaw, the other leg portion serving as a stabilizer guide for the movable jaw of the vice.

3,661,378

GRIPPING DEVICE

Harry G. Dodge, and Leonard P. Spontelli, both of Painesville, Ohio, assignors to Crawford Fitting Company, Solon, Ohio

Filed Sept. 30, 1969, Ser. No. 862,296
Int. Cl. B25b 1/20
U.S. Cl. 269—131 17 Claims



A vise-like apparatus for securing a workpiece with a flexible, elongated, extensible binding member is disclosed as having a body which includes a pair of opposed side faces and a work supporting cradle, an opening in the body, and means providing a binding member having one portion secured within the body and having another portion in communication with the opening for securing the workpiece. Guide means are disposed adjacent the opening for guiding the binding member through the opening. The guide means include a pair of guide rollers disposed beneath and adjacent to the opening. The supply means for the binding member includes a spool secured between the side faces of the body. In one embodiment, one end of the binding member is secured to the spool while the other end is capable of being extended from the spool through the opening to envelop a workpiece and be reinserted into the opening for reengagement with that portion of the binding member remaining on the spool. In an alternative embodiment, the binding member is secured to the spool so that two free ends are exposed. Adhering means, such as adhesives or fastening tape, are secured to the respective ends of the binding member for rapid connection of the ends after disposition about the workpiece. Torquing means are provided to tension the binding member about the workpiece. Locking means are provided to prevent inadvertent loosening of the band from the workpiece. Release means are provided for releasing the locking means when the operator desires to free the workpiece.

3,661,379

METHOD AND APPARATUS FOR OPENING SIGNATURES

Leonardo Dolfini, via Boscovich, Milan, Italy

Filed May 14, 1970, Ser. No. 37,087
Claims priority, application Italy, May 26, 1969, 17341 A/69
Int. Cl. B65h 39/02
U.S. Cl. 270—54 14 Claims

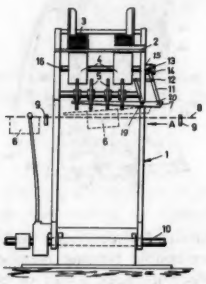
Signatures are opened up during travel on a conveyor in a substantially horizontal plane by means of suction heads which lift all sheets above the lower center sheets of successive signatures. The thus opened signatures are transferred onto a wedge-like support which extends into the space between the center sheets.

3,661,380

APPARATUS FOR LOADING SHEETS ON A CONVEYOR

Hans Muller, Zofingen, Switzerland, assignor to Grapha Maschinenfabrik Han Muller AG, Zofingen, Switzerland

Filed Mar. 6, 1970, Ser. No. 17,123
Claims priority, application Switzerland, Mar. 7, 1969, 3500/69
Int. Cl. B65h *5/04*
U.S. Cl. 271—14 11 Claims



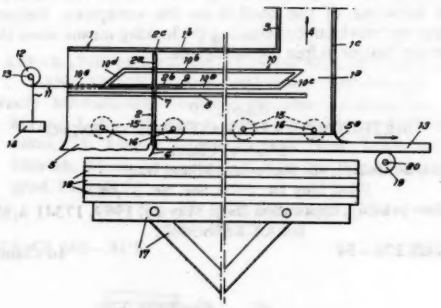
Folded sheets are partly unfolded and deposited in a straddling position on a holder bar which is reciprocated along a conveyor so that the sheet is accelerated and moves at a minimum speed relative to the conveyor when in the direction of movement of the conveyor when stripped from the holder bar. During movement of the holder bar and sheet in a forward stroke in the direction of movement of the conveyor, the leading end of the holder bar is moved toward the conveyor to facilitate the transfer.

3,661,381

PNEUMATIC CONVEYORS

Bernard Kuzniak, Place J. B. Moulin, Lezoux, France

Filed Mar. 19, 1970, Ser. No. 20,906
Claims priority, application France, Apr. 18, 1969, 6912139
Int. Cl. B65h *3/08*
U.S. Cl. 271—26 12 Claims



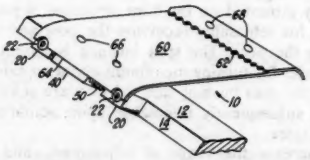
A conveyor operating by suction for transporting flat or longitudinally corrugated rectangular articles placed on an elevating table, with a suction source, means for advancing each article to be transported in sealing contact with a box or chamber having the form of a rectangular parallelipiped open over the whole of its lower side and in communication with the suction source and means for only permitting the suction to be usefully applied to the article in the part of the chamber against which the article is located at a given moment. The means for advancing the product and the means for allowing the suction to be applied usefully to the product comprise a common device which forms a movable end wall of the box or chamber opposite a fixed wall beyond which the product is transported. The suction mechanism is connected to the end of the box or chamber adjoining the fixed wall, and the movable wall is able to move in a practically fluid-tight manner along the box or chamber. The open side of the chamber has sealing means which engage the article to be displaced, and the movable wall carries guide rollers which cooperate with slots disposed respectively in vertical walls of the box or chamber, the displacement of the movable wall being effected through the action of suction. Means are also provided to urge the movable wall towards its position of rest.

3,661,382

TORSIONALLY SPRING LOADED FEEDER PLATES

Gordon M. Spicer, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 6, 1970, Ser. No. 78,421
Int. Cl. B65h *3/24*
U.S. Cl. 271—44 7 Claims



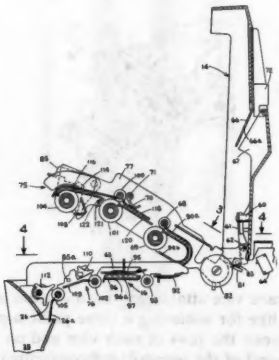
An apparatus for sequentially removing sheets from the bottom of a stack with a reciprocating feeder bar including means for pivotally mounting feeder plates at laterally spaced intervals along the bar. Coil springs are used to spring load the feeder plates with respect to the bar and permit relative motion between the plates and the bar without substantial flexing of the plates.

3,661,383

DOCUMENT HANDLING APPARATUS FOR PHOTOCOPY MACHINES

Douglas I. Morrison, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 22, 1970, Ser. No. 4,945
Int. Cl. B65h *5/06*
U.S. Cl. 271—51 9 Claims



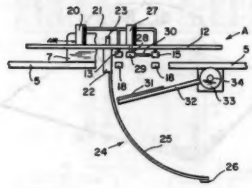
Compact original document sheet handling apparatus for photocopy machines is adapted such that various opposed sheet feeding and guiding elements can be conveniently, manually separated to render substantially the entire sheet feed path readily accessible, thereby facilitating retrieval of stranded original sheets therefrom.

3,661,384

ARCUATE STACKER

Kenneth O. Morton, Troy, N.Y., assignor to Cluett, Peabody & Co. Inc., Troy, N.Y.

Filed June 12, 1970, Ser. No. 45,763
Int. Cl. B65h 31/10, 31/26
U.S. Cl. 271—88 6 Claims



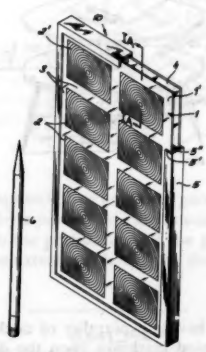
This invention is directed to a stacker for garment work pieces in which each work piece is fed to an arcuate receiver by controlled air jets and is deposited in the receiver by a mechanical presser bar against the resistance of a radially disposed movable table carried by a radial arm concentric with the receiver.

3,661,385

OPTICAL-ILLUSION DEVICE

Henry Schneider, 221 East 32nd Street, New York, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,702
Int. Cl. A63j 15/00
U.S. Cl. 272—8 M 1 Claim



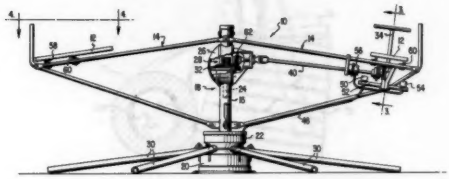
A device for creating optical illusions comprising a transparent sheet, a plurality of fresnel screens spaced apart and in a regular array on the sheet, a condensing lens formed by each of the fresnel screens and a reflecting surface juxtaposed with the sheet.

3,661,386

ROUNDABOUT

William I. Green, 179 Putman Avenue, Brooklyn, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,507
Int. Cl. A63g 1/12
U.S. Cl. 272—33 R 8 Claims



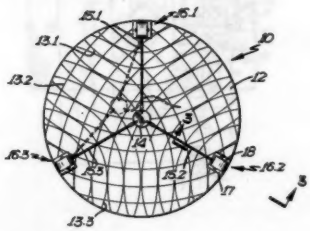
Riding occupant propelled roundabout for amusement parks and the like wherein an automobile rear axle and differential assembly function as a combined vertical support structure and gear reducer.

3,661,387

REACTION GAME APPARATUS

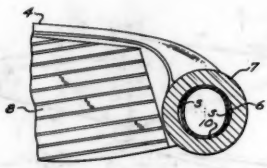
James M. Winey, and Karen L. Winey, both of 1017 6th Street West, White Bear Lake, Minn.

Filed July 30, 1970, Ser. No. 59,598
Int. Cl. A63f 9/00
U.S. Cl. 273—1 M 10 Claims



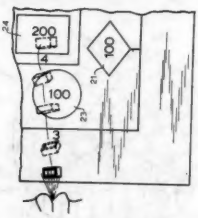
An action game apparatus having a board with a playing surface and a game element suspended above the surface by taut, substantially horizontal filaments releasably anchored at the board periphery and tending to pull the game element. On a given signal each player tries to be the first to release his filament thus causing the game element to move away from him and drop to the board surface. The game element is a magnet and the board surface is of magnetic material to hold the game element, when engaged, from sliding across the playing surface which has scoring indicia and markings thereon. In one embodiment the filaments are resilient to provide the motive force to move the game element and in a second embodiment the motive force is provided by magnetic attraction between the game element and a ring magnet encircling the central area of the board.

3,661,388
STRIKING IMPLEMENT AND HEAD ASSEMBLY THEREFOR
Gurdon Leslie, North Madison, Ohio, assignor to True Temper Corporation, Cleveland, Ohio
Filed Oct. 29, 1969, Ser. No. 872,274
Int. Cl. A63b *53/02*; A01b *1/22*; B25g *3/10*
U.S. Cl. 273—80.2 **9 Claims**



A shaft or handle has a shank portion of oblong cross section force fitted into a cylindrical socket in the head of a striking implement, there being spaces at the sides of the oblong shank between the shank and the socket wall containing epoxy bonding compound or other adhesive.

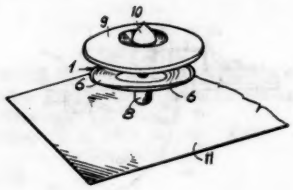
3,661,389
GAME HAVING TARGET AREAS AND PIECES TO BE BLOWN TOWARD THESE AREAS
Thomas L. Harris, Route 4, P.O. Box 69; Joyce W. Boone, Route 4, P.O. Box 311, and Allen G. Thomas, 1717 Westwood Avenue, all of Wilson, N.C.
Filed Feb. 9, 1971, Ser. No. 113,893
Int. Cl. A63b *63/00*
U.S. Cl. 273—95 C **4 Claims**



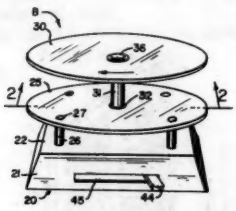
A game includes a game board having variously shaped target areas thereon and light-weight, variously shaped, game pieces which are placed on the game board and upon which puffs of air are directed by participants. Participants' skills are directed according to rules of the game toward causing the game pieces to jump through the air and come to rest within the target areas.

3,661,390
RESILIENT BOUNCER DEVICE FOR PIN TABLE BUMPERS
Claudio Cecchetti, Via Verdi 50, Cernusco sul Naviglio, Province of Milan, Italy
Filed Oct. 2, 1969, Ser. No. 863,232
Claims priority, application Italy, Nov. 30, 1968, 24445 A/68
Int. Cl. A63b *71/00*
U.S. Cl. 273—129 **4 Claims**

This disclosure relates to a bouncer device for pin table bumpers and comprises a resilient metallic substantially concave or cup shaped plate having a plurality of equidistant peripheral slots and mounted with its axis substantially vertical on the stem of a pin table bumper, the peripheral edge of the metallic plate having a greater inclination than the other portions thereof. When struck by a ball, the cup shaped plate deforms elastically and causes the ball to bounce away from the bumper.



3,661,391
VARIABLE PATTERN THREE-DIMENSIONAL GAME BOARD
John M. Henshaw, Salina Star Route, Boulder, Colo.
Filed Mar. 2, 1970, Ser. No. 15,614
Int. Cl. A63f *3/02*
U.S. Cl. 273—131 A **6 Claims**



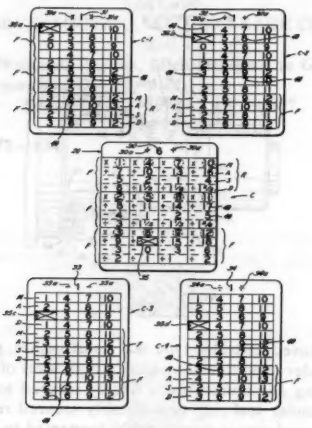
A game board having a plurality of decks one above the other with correlated markings upon the decks to permit a game to be played on both decks. The decks are shiftable with respect to each other so that the relative position of the markings of one deck will change with respect to the markings of the other deck in accordance with a selected pattern. In the preferred embodiment of this invention, the decks are made symmetrical about a common axis in order to effect the shifting action by rotation of one deck with respect to the other. This rotation of one deck with respect to the other is effected through a ratchet mechanism to permit the rotation to be stepwise to maintain the correlation of one deck with respect to the other at all positions.

3,661,392

ARITHMETIC CARDS AND GAME UTILIZING SUCH

Thomas M. Abney, 611-7th Street, Humble, Harris County, Tex.

Filed Aug. 10, 1970, Ser. No. 62,335
Int. Cl. A63f 1/02
U.S. Cl. 273—152.1 5 Claims



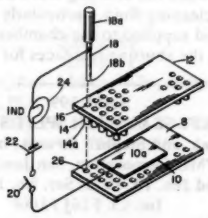
A new and improved card specifies arithmetical relationships in a manner permitting a new and improved arithmetic game to be played for education or entertainment using a plurality of such cards.

3,661,393

PROBE GAME

Arthur W. Skebeck, 802 Karylou Circle, Kingsville, Md.

Filed Feb. 16, 1970, Ser. No. 11,664
Int. Cl. A63g 9/06
U.S. Cl. 273—153 R 3 Claims



A game is comprised of an unknown geometric shape overlaid and hidden by a perforated plate means. A probe is used to probe through the perforations of the perforated plate so as to discover the extent and hence the shape of the geometric figure.

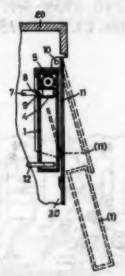
3,661,394

TAPE RECORDER WITH POINTER DRIVE

Imre Siller, Nuernberg, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inhaber Max Grundig, Furth Bayern, Germany

Filed Apr. 14, 1970, Ser. No. 28,426
Claims priority, application Germany, Apr. 15, 1969, G 69 14 932
Int. Cl. G11b 15/32
U.S. Cl. 274—4 C 10 Claims

A tape cartridge is inserted into a pivotally mounted opened holding lid and assumes a preliminary position in which a coupling means in the cartridge is aligned with a coupling means on a drive shaft projecting from the tape recording housing. When the holding lid is closed, the



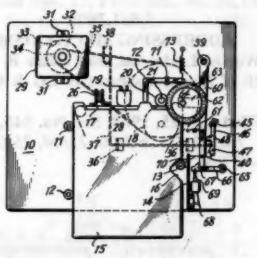
coupling means engage each other and the drive shaft drives a pointer-operating transmission through the engaged coupling means.

3,661,395

MAGNETIC TAPE FAST FEED CONTROL APPARATUS

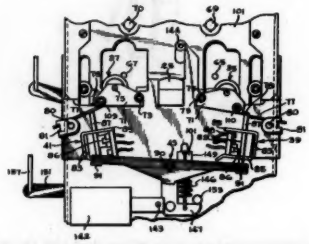
Itsuki Ban, 829 Higashi-Oizumimachi Nerima-ku, Tokyo, Japan

Filed May 5, 1970, Ser. No. 34,736
Claims priority, application Japan, May 8, 1969, 44/34785
Int. Cl. G11b 5/54; B65h 17/20, 17/48
U.S. Cl. 274—4 B 6 Claims



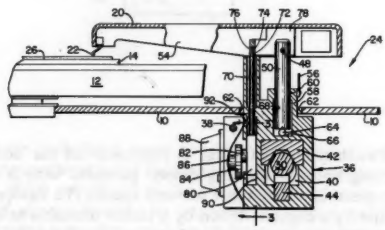
An endless tape cartridge is insertable on the deck of a recording and reproducing device provided with a normal drive speed and timed fast forward speed. The device drives the tape by a capstan driven by a motor rotatable at either a fast or low speed and having large and small driving pulleys either of which is connected by a drive belt to the flywheel of the capstan. To advance the tape rapidly, the fast forward drive is actuated by control curcuitry including a timer operated switch which actuates a solenoid to in turn pivot a belt shifting lever to move the belt from the small to the large diameter pulley and to simultaneously electrically operate the motor at a fast speed. An associated stopper lever latches the belt shifting lever in its fast position while suitable linkage pivots the device's magnetic head clear of the tape. The fast forward operation continues until the timer operated switch actuates curcuitry controlling a release lever which is connected through suitable linkage to shift the stopper lever to allow the belt shifting lever to return the belt and motor speed back to the normal, lower speed.

3,661,396
DIRECTIONAL CONTROL SWITCH MEANS FOR A CASSETTE CHANGER
Glenn E. Sterly, Carol Stream, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed Nov. 10, 1969, Ser. No. 875,375
Int. Cl. G11b *15/26*
U.S. Cl. 274—4 D 7 Claims



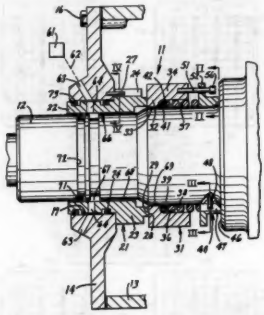
A cassette changer, which is shiftable between a pause mode and an operational mode, is provided with directional control switch means which remain in given positions during shifting to a pause mode to assure that the same direction of tape drive is resumed upon termination of the pause mode. Preferably, the directional control switches are interconnected by a mechanical means in the form of a rocker arm which extends between the switches to shift and to assure that the switches are mutually exclusively operated to opposite positions.

3,661,397
ADDRESSING MECHANISM
Edward L. Worth, Lexington, and Allan B. Chertok, Cambridge, both of Mass., assignors to EG & G Inc., Bedford, Mass.
Filed July 25, 1969, Ser. No. 845,022
Int. Cl. G11b *3/00, 25/04, 25/06*
U.S. Cl. 274—9 RA 9 Claims



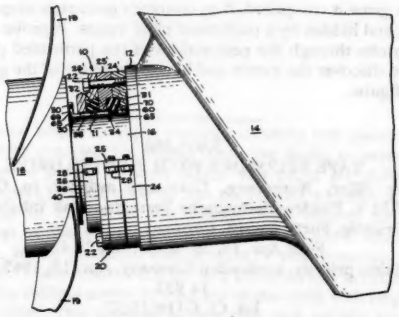
A device for retrieving selected informational material stored in a groove formed in a rotatable recording element. A stylus, which is disposed above the recording element, is mounted at a fixed, reference position to a transport mechanism which may be moved to position the stylus over that portion of the groove at which the particular information is stored. The device then lowers the stylus into the groove. When in the lowered position, the stylus is permitted limited freedom of movement so that it may track in the groove as the recording element is rotated. After the desired information has been retrieved the stylus is raised to the reference position.

3,661,398
SANITARY SEAL
Herbert B. Hummer, Kalamazoo, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.
Filed Sept. 21, 1970, Ser. No. 73,721
Int. Cl. F16j *15/30, 15/38, 15/40*
U.S. Cl. 277—74 10 Claims



An improved cartridge-type seal construction, particularly for use under conditions requiring a high level of sanitation, same having an annular insert fixedly secured to a housing and an annular seal ring nonrotatably secured relative to a shaft. The seal ring is nonrotatably connected to a collar by means of headed drive pins which prevent the collar and seal ring from being axially separated. A spring is confined within and coacts between the collar and the seal ring for resiliently urging the seal ring into abutting, sealing engagement with a mating face on the insert. The corners and recesses on the seal ring and insert are preferably provided with rounded, substantially smooth contours for preventing collection of bacteria or other contaminating material. The collar and seal ring, together with the spring confined therebetween, are removable from the shaft as a unit to facilitate assembly or disassembly of the seal construction. The insert and seal ring surround and cooperate with the shaft so as to define an internal chamber, which chamber communicates with the interface area between the abutting seal faces and is connected to a supply of cleaning fluid, particularly steam, whereupon the cleaning fluid supplied to the chamber flows radially outwardly between the abutting seal faces for cleaning same.

3,661,399
SHAFT SEAL WITH SPLIT SLEEVE
Edward J. Krisak, and Stephen Strozak, both of Indiana, Pa., assignors to FMC Corporation, San Jose, Calif.
Filed Jan. 13, 1971, Ser. No. 106,188
Int. Cl. F16j *15/34*
U.S. Cl. 277—94 5 Claims



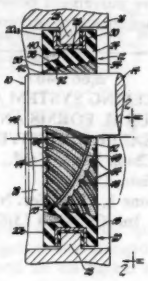
A shaft seal of a type suitable for use on marine vessels to enclose a propeller shaft between a stern tube and a

propeller hub has a stationary housing fastened to the stern tube, a sleeve split longitudinally into diametrically opposed segments which fit around the propeller shaft and extend from the propeller hub into the stationary housing, and at least one seal element secured circumferentially about the sleeve within the stationary housing.

3,661,400
HYDRODYNAMIC SEAL WITH LEAKAGE CONTROL RIB

Louis H. Weinand, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1970, Ser. No. 79,007
Int. Cl. F16j *15/32, 15/48*
U.S. Cl. 277—134 **4 Claims**

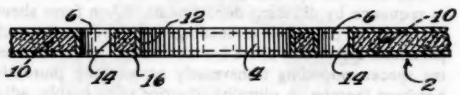


A hydrodynamic seal for rotating shaft is provided with a supplemental leakage control rib inclined opposite to the hydrodynamic ribs for returning leaking fluid by gravitational, adhesion, and surface tension forces to the sealing interface and the pumping influence of the ribs.

3,661,401
GASKET

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., Lyons, Ill.

Filed May 25, 1970, Ser. No. 40,112
Int. Cl. F16j *15/10*
U.S. Cl. 277—227 **3 Claims**

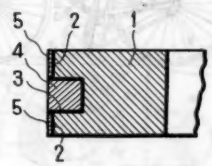


A method of manufacturing tailored gaskets and the article produced thereby wherein a suitable gasket material is provided with a coating applied in such a manner that there is little loss of coating material, and manufacturing costs are lowered. Ideally, the gaskets are formed from materials in the sheet, blank or web form using single or multiple die-cutting operations before and after the gasket material in various forms is coated with a fluid-impermeable coating.

3,661,402
PISTON RING

Kouichi Iizuka, Kamio, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1970, Ser. No. 62,347
Claims priority, application Japan, Aug. 15, 1969, 44/64209
Int. Cl. F16j *9/00*
U.S. Cl. 277—235 A **3 Claims**

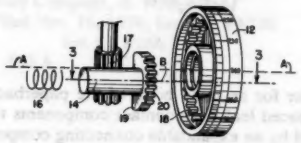


A piston ring with a highly wear-resistant sliding surface of tungsten-cobalt electrodeposit and a sliding ring of a sintered mixture of iron oxide and carbon powder.

3,661,403
PRECISION INDEXING FIXTURE

Robert R. Path, Santa Monica, Calif., assignor to Path Industries, Inc.

Filed Apr. 27, 1970, Ser. No. 32,152
Int. Cl. B23b *5/22, 5/34, 31/36*
U.S. Cl. 279—5 **6 Claims**

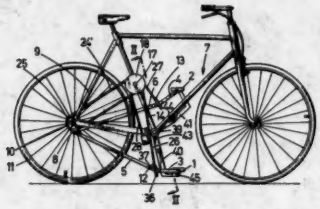


An indexing fixture for use in machine shops includes a casting mounting an indexing wheel enabling desired rotative positioning of a work held within a collet holder spindle on the fixture. The indexing wheel includes internal serrations defining a ring gear for cooperation with a plunger membe. mounted in a bore in the casting for movement towards the ring gear. The plunger member includes gear teeth dimensioned to mesh with a corresponding number of teeth on the ring gear, the gear teeth being tilted slightly to result in a wedging action of the plunger gear teeth with the ring gear when the plunger member is moved into meshing engagement with the ring gear. A positive locking of the plunger member to the index wheel results even through the teeth may become worn so that desired consistent indexing of a part or work can be realized.

3,661,404
BICYCLE

Camille M. Bossaer, Baron Ruzettelaan 265, Saint Michiels, Belgium

Filed May 11, 1970, Ser. No. 36,369
Claims priority, application Belgium, May 13, 1969, 732.960
Int. Cl. B62m *1/04*
U.S. Cl. 280—255 2 Claims

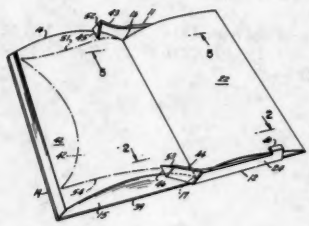


A bicycle with alternating-motion pedals the movement of which is converted by particular chain means into a rotating motion which is applied to the driving wheel of the bicycle.

3,661,405
HOLDER FOR OPEN BOOKS

Alexander M. Brown, 715 South Beach Street 309-D, Daytona Beach, Fla.

Filed Dec. 28, 1970, Ser. No. 101,578
Int. Cl. B42d *9/00*
U.S. Cl. 281—42 7 Claims



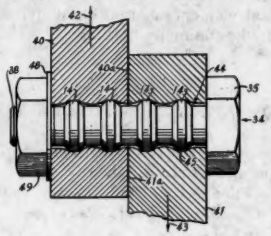
A holder for an open book of the paperback type has a pair of spaced leaf edge contact components that are interconnected by an expandable connecting component adapted for insertion between pages of the held book. The leaf edge contact components feature bendable portions that are equipped with a detent that overlies portions of one of the open pages and one of the contact components has a tab that overlies a portion of the other open page. Page guiding edges are provided on the detents and provisions are made for preventing withdrawal of the interconnecting component during use of the device.

3,661,406
RETENTION MEANS

Joseph J. Mele, 188 Warner Road, Huntington, N.Y.

Filed Oct. 21, 1969, Ser. No. 868,120
Int. Cl. F16b *5/02*
U.S. Cl. 287—189.36F 1 Claim

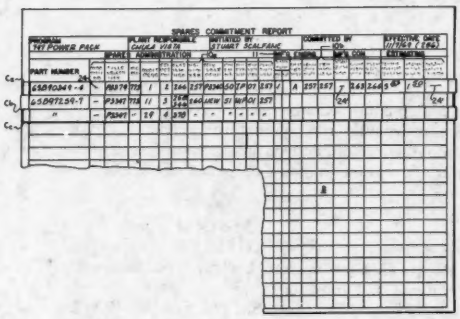
A shaft is provided with a plurality of peripheral lands which are press fitted into an aperture formed in a plate, housing or other structure. The lands are intersected by inclined surfaces which together with the surface of the shaft and aperture define spaced regions adjacent to the lands. Said press fitting subjects the material of the plate, housing or other structure to stress which urges said material to flow into said spaced regions, thereby relieving said stress and interfering with relative movement between the shaft and the plate, housing or other structure accommodating the shaft.



3,661,407
RECORD KEEPING SYSTEM AND METHOD EMPLOYING PLURAL FORMS AND CO-OPERATING REUSABLE ADHESIVE STRIP

James R. Warren, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed June 1, 1970, Ser. No. 41,930
Int. Cl. B42d *15/00*
U.S. Cl. 283—55 7 Claims



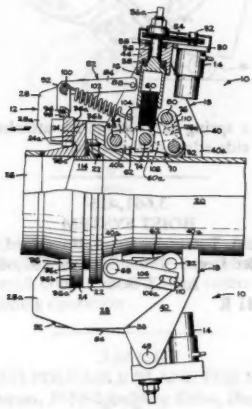
Two different, but related form sheets are provided for use in sequence by different departments. EAch form sheet has two separate pluralities of headings thereon, one for each department. Each form sheet has also one or more strip receiving spaces extending transversely across both pluralities of headings thereon. A plurality of strips of re-usable, adhesive backed writing material are provided, each strip being of a size to fit onto, and to extend the entire length of, one of said spaces. With one of the strips adhesively applied to its space on a first form sheet, data entries are made on the strip by the originating department in register with each of the headings of the first plurality thereof. The strip is then peeled off and forwarded to a follow-up department, where the strip is adhesively applied to one of the spaces provided on a second form sheet and entries are made on the strip by the follow-up department in register wit each of the headings of the second plurality thereof. The completed strip is then peeled off of the second form sheet and returned to the originating department, where it is adhesively reapplied to its previous space on the first form sheet for billing and filing as a permanent record of the complete procedure.

3,661,408

POWER-ACTUATED PIPE COUPLER

Harold M. Gibbons, Long Beach, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 13, 1970, Ser. No. 27,913
Int. Cl. F16l 35/00
U.S. Cl. 285—18 14 Claims



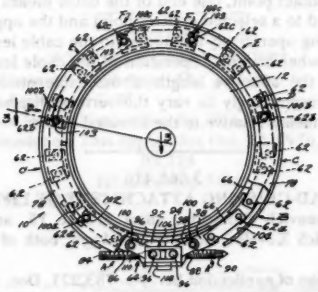
A power-actuated pipe coupler for quickly, securely, and releasably coupling together two flanged conduits, such as a marine loading arm and an oil tanker's manifold, in fluid-tight coaxial relationship. The coupler includes a plurality of clamp assemblies mounted on and spaced circumferentially around the end flange of the arm, and power supplied by a hydraulic, pneumatic or electric motor is transmitted through a belt, chain or gear drive unit, a screw shaft, and a toggle link assembly to open and close hook-shaped clamp arms about the manifold flange.

3,661,409

MULTI-SEGMENT CLAMP

Robert T. Brown; Don E. E. Vogler, and Gerald A. Marsh, all of Houston, Tex., assignors to Gray Tool Company, Houston, Tex.

Filed Aug. 14, 1969, Ser. No. 850,169
Int. Cl. F16l 17/06
U.S. Cl. 285—82 11 Claims



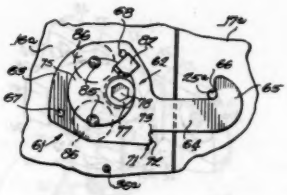
The clamping wedges are composed of similar tapered segments joined together by link bars and pins to form an unending chain whose circumference is varied by a threaded drive screw joining the end segments. Decreasing the chain circumference forces the wedges onto mating tapers on the conduit joint, drawing them together by mechanical advantage. Structure is provided for permitting limited axial movement of the clamps during joint make-up to facilitate drawing together the parts to be joined from a separated position.

3,661,410

PANEL LATCHING MECHANISM

Robert S. Larson, and Joseph Stochke, both of Rockford, Ill., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed July 7, 1970, Ser. No. 52,897
Int. Cl. F16b 2/18
U.S. Cl. 287—20.924 8 Claims



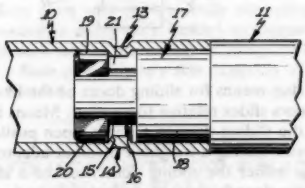
A latching mechanism between adjacent panels of a sectional cabinet or building construction where a pair of opposing latch housings are imbedded in the facing edges of the panels with one housing containing a rotatable latch bolt and the opposite housing containing a transverse latch pin or strike cooperating with the hook end of the bolt. The bolt structure includes a generally circular body with an offset and outwardly extending arm terminating in a latching hook and has a central circular opening for a rotating cam. The cam has an offset hub or shaft received in aligned bearings in the housing, a tab extending from one flat surface cooperating with projections on the bolt body, and spring means retaining the cam within the opening in the bolt.

3,661,411

JOINT CONSTRUCTION

Kenneth E. Flick, New Brighton, Minn., assignor to Jewell Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1970, Ser. No. 89,750
Int. Cl. F16b 7/20
U.S. Cl. 287—103 A 3 Claims



A scaffold coupling of the bayonet joint type in which internal ridges in the female member are formed by depressing material inwardly to form ridges of the desired shape. The portion of the male member extending into the female member is of substantially the same external diameter as the internal diameter of the female member so that the two members are held firmly together. The male member may either be secured to a base plate or within a tubular member of the same external diameter as the female member. The male member may be formed by machining or casting.

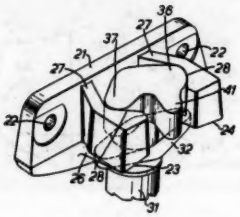
ERRATUM

For Class 287—189.36 F see:
Patent No. 3,661,406

3,661,412
FASTENING MECHANISM FOR DOORS

Barry S. Morris, New Town, near Walsall, England, assignor to The Bloxwich Lock and Stamping Company Limited, Bloxwich, Walsall, England

Filed July 8, 1970, Ser. No. 53,142
Int. Cl. E05c *3/04*
U.S. Cl. 292—218 **5 Claims**

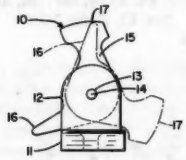


In door fastening mechanism, particularly for the doors of freight containers or vehicles, comprising a bar mounted for angular movement about its axis on a door and carrying at its ends fastening members adapted to engage with keepers on the door frame, the fastening members are opposed forks which engage with spaced lugs on the keepers, the lugs having oppositely inclined surfaces which are engaged by limbs of the forks to urge the door towards the closed position.

3,661,413
DOOR STOP MEANS

Manuel D. Silva, 21440 Oak Street, Hayward, Calif.

Filed Sept. 11, 1970, Ser. No. 71,454
Int. Cl. E05c *3/04*; E05d *13/04*
U.S. Cl. 292—238 **8 Claims**



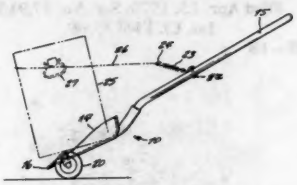
Door stop means for sliding doors or the like whereby one of the doors slides relative to another. Means is provided for holding the sliding door in a partly open position by mounting a device having a weighted member adapted to selectively engage either the sliding door itself or a stop thereon to prevent the door from opening past a desired position.

3,661,414
SHOVEL CART

Frank Roth, 6840 Thomas Street, Hollywood, Fla.

Filed June 17, 1970, Ser. No. 47,016
Int. Cl. B62b *1/12, 1/14*
U.S. Cl. 294—59 **2 Claims**

A cart readily formed from any square shovel by removably securing therebelow a carriage comprised of a telescopic axle shaft mounted at its opposite ends upon a pair of wheels, and the axle shaft end sections each including a spring band clamp for attachment over one of the opposite ends upon a pair of wheels, and the axle shaft end sections

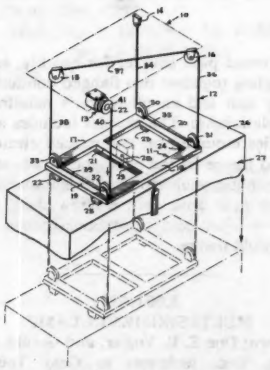


each including a spring band clamp for attachment over one of the opposite side edges of the shovel.

3,661,415
HOIST SYSTEM

Frank N. Piasecki, Tunbridge Road, Haverford, Pa.

Filed Dec. 5, 1969, Ser. No. 882,687
Int. Cl. B66c *1/00*
U.S. Cl. 294—81 R **3 Claims**



A hoist system including elevated means having spaced contact points, carrier means disposed below the elevated means, having similarly arranged contact points, cable means operatively interconnecting the contact points for carrying the carrier means below the elevated means, means for varying the effective length of the cable means disposed at a selected contact point, one end of the cable means being fixedly secured to a selected contact point and the opposite end thereof being operatively connected to the cable length varying means whereby upon operation of the cable length varying means the effective length of the cable means will be varied correspondingly to vary the vertical displacement of the carrier means relative to the elevated means.

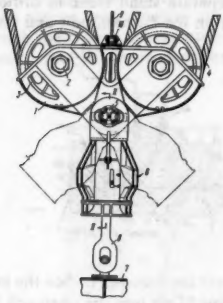
3,661,416
LOAD-GRIPPING ATTACHMENT OF LIFTS

Boris Antonovich Bukarkin, ulitsa Frunze 15, and Valery Nikolaevich Kovalev, ulitsa Foleevskaya, both of Nikolaev, U.S.S.R.

Continuation of application Ser. No. 783,221, Dec. 12, 1968, now abandoned. This application Mar. 31, 1971, Ser. No. 129,978
Int. Cl. B66c *1/38*
U.S. Cl. 294—83 **6 Claims**

A load-gripping attachment for lowering small craft from the mother ship and lifting them back onto the latter ship comprising a body having a longitudinal axis. A liner is installed in the body for movement along the longitudinal axis

of the body. Side ports are provided in the liner and swivelling thrust elements are mounted in the liner and located in the side ports of the liner. Side ports are also provided in the body and are intended for receiving the swivelling thrust elements when the liner is moved by the rod head of the small craft. The rod head enters the liner in the process of gripping operation.

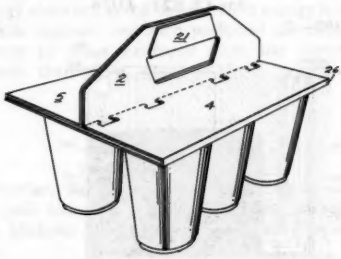


3,661,417

CARRIER AND FOLDABLE BLANK FOR MAKING SAME

Richard B. Inman, 3155 Spaulding Drive, Dunwoody, Ga.

Filed Apr. 24, 1970, Ser. No. 31,724
Int. Cl. B65d *71/00*
U.S. Cl. 294—87.2 **9 Claims**



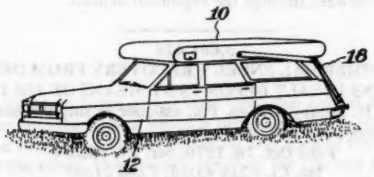
A carrier for beverage cups comprising a foldable paperboard blank having holes through which the cup bodies fit but which engage enlarged cup rims. Portions of the blank are foldable to form a cover over the cups, handles and locking tabs. Access to the cups is provided by tearing along perforations.

3,661,418

PORTABLE CAMPING UNIT

Ray S. Stewart, Waukegan, Ill., assignor to Willard C. Rogers, Lawndale, Calif.

Substitute for application Ser. No. 771,871, Oct. 30, 1968, now abandoned. This application Oct. 22, 1970, Ser. No. 83,225
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 MC **1 Claim**



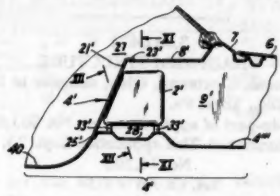
A portable camping unit which can be collapsed into a small compact package carried on the roof of a vehicle, and when assembled, can be self supporting away from the vehicle for use as a tent like structure.

3,661,419

REAR BODY CONSTRUCTION FOR AN AUTOMOBILE

Rakuzo Mitamura, Hekikai-gun; Masatoshi Yamaya, and Masakatsu Suzuki, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1970, Ser. No. 86,796
Claims priority, application Japan, Dec. 9, 1969, 44/98321
Int. Cl. B60r *5/04*
U.S. Cl. 296—24 R **12 Claims**



An automobile includes a rear body portion with a trunk space in which a fuel tank is disposed immediately behind the closure wall for the passenger compartment. The backing of the rear seat is formed by a continuation of the passenger compartment floor plate upwardly in a curve behind the seat location. The backing or end wall and the passenger compartment floor are advantageously made of a single plate thereby forming a seal of the passenger compartment in respect to the rear trunk space behind the end wall. A fuel tank is mounted within the trunk space directly behind the curved plate end-wall and it is located over a trunk floor having an opening to the exterior to provide means for dumping the gasoline outwardly below the trunk space in the event of an accident and a rupture of the gas tank. The rear portion of the body is simply formed by tack welding of the upwardly curved rear plate, forming a continuation of the passenger compartment floor at each of its sides to extension of an interior tire housing and to a shelf portion formed at the rear of the vehicle above the trunk space. The tire housing on each side is easily spot welded immediately to both sides of the backing plate and the floor plate. With the method of the invention, the floor plate with the upwardly extending protection wall formation is easily tack welded to extensions of a tire housing on each side of the vehicle to complete the interconnection of a floor assembly to a side assembly of the vehicle at the rear thereof.

3,661,420

CONTRA-LEVERAGE CONSTRUCTION FOR A TRUCK-AND-LIKE STAKE

Raymond W. Swanson, 14515 Cornishcrest Road, Whittier, Calif.; Marvin M. Yaffe, deceased, 5542 Sierra Vista Avenue, Los Angeles, Calif., and Beverly Ruth Yaffe, administratrix, 1165 S. O. M. Center Road, #305 Mayfield Heights, Ohio

Filed July 19, 1968, Ser. No. 746,043
Int. Cl. B60p *7/06*
U.S. Cl. 296—43 **1 Claim**

For a combination of a truck with horizontally positioned load platform, a truck stake, a truck stake receptacle and a truck load over said platform a means for tilting the truck stake towards the truck load for increasing the truck stake resistance to the truck load leverage pressure thereagainst

when an end section of the truck stake is inserted into the truck stake receptacle and the truck stake receptacle is

secured with the horizontally positioned load platform and the load is loaded over the latter.

3,661,421

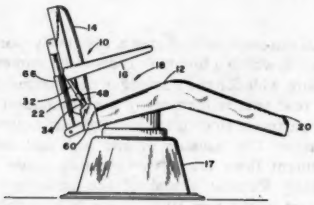
CHAIR ARM STRUCTURE

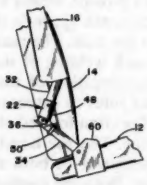
Philip C. Johnson, Cincinnati, Ohio, assignor to Dentsply International Inc., York, Pa.

Continuation-in-part of application Ser. No. 863,085, Oct. 2, 1969, now abandoned. This application Sept. 23, 1970, Ser. No. 74,308

Int. Cl. A47c *7/54*

U.S. Cl. 297—417 **13 Claims**





A support for chair arms pivoted to the back, respectively at one or both sides, for movement between a lower arm-supporting position and an elevated position to facilitate ingress and egress to and from the seat of the chair. The support includes link means operable in tension to support the arm in said lower position to minimize danger from accidental movement of the arm to a lower position and also provide desired clearance between said arm and chair seat without obstruction by said supporting link means.

3,661,422

SELF-ADJUSTMENT FOR BODY SUPPORT CUSHION

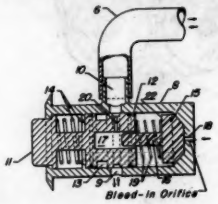
Joseph Sember, Glendale, Calif., and Eugene R. McGregor, Morris, Conn., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 20, 1970, Ser. No. 56,574

Int. Cl. A47c *7/14, 7/46*

U.S. Cl. 297—284 **4 Claims**

In combination with a body support cushion unit where open-cell foam is used in an air-tight envelope and a manually controllable valving means in a passageway to the envelope is utilized so as to regulate flow of ambient air pressure into and out of the foam, there is additionally provided a special valving device as a part of the valving means for the unit which includes a separate movable blocking member seatable over a separate small bleed-in orifice. Thus, when there is no weight on the cushion unit and no back pressure



on the member over the bleed-in orifice the latter can permit a slow metered flow of air into the open-cell foam as long as it is under a vacuum condition, while, conversely, any pressure on the foam will cause a back pressure condition and a seating of the movable blocking member over the bleed-in orifice.

3,661,423

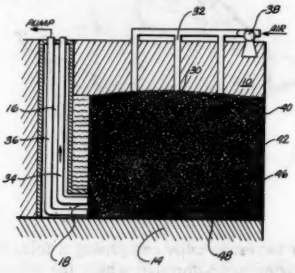
IN SITU PROCESS FOR RECOVERY OF CARBONACEOUS MATERIALS FROM SUBTERRANEAN DEPOSITS

Donald E. Garret, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Feb. 12, 1970, Ser. No. 10,871

Int. Cl. E21b *43/26*

U.S. Cl. 299—2 **29 Claims**



Subterranean carbonaceous deposits, such as oil shale, are conditioned for in-situ recovery of carbonaceous values by limited undercutting over a large area to leave an overlaying deposit supported by a multiplicity of pillars, if necessary, then removing the pillars and expanding the overlaying deposit to fill the entire void with particles of a uniform size, porosity and permeability. Communication is then established with the upper level of the expanded deposit and a high temperature gaseous media which will liquify or vaporize the carbonaceous values is introduced in a manner which causes the released values to flow downward for collection at the base of the expanded deposit. Convenient media are hot flue gases created by igniting the upper level of the expanded carbonaceous deposit and forcing a flow of hot gases downward through the expanded deposit.

3,661,424

GEOTHERMAL ENERGY RECOVERY FROM DEEP CAVERNS IN SALT DEPOSITS BY MEANS OF AIR FLOW

Charles H. Jacoby, Dalton, Pa., assignor to International Salt Company, Clarks Summit, Pa.

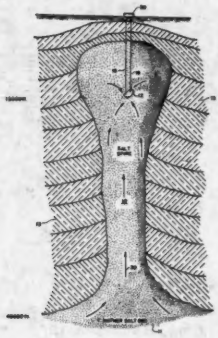
Filed Oct. 20, 1970, Ser. No. 82,231

Int. Cl. E21b *43/28;* **F28d** *21/00*

U.S. Cl. 299—4 **11 Claims**

There is disclosed a method for abstracting geothermal heat from depths below ground that are inaccessible by com-

mercially practicable bore hole drilling techniques. More particularly, the invention is of a method for extracting heat from such an inaccessible source which comprises forming a cavern or reservoir at an accessible depth in a salt dome or spire which is in thermal communication with the otherwise inaccessible heat source, and flowing air at comparatively low speeds through the cavern in heat-exchange relation with the wall surfaces thereof to absorb heat therefrom, and then



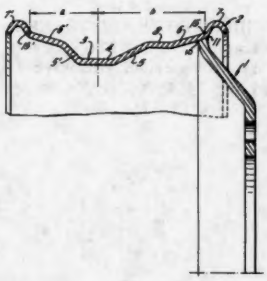
flowing it speedily through a relatively small (compared to the cavern volume) passageway to a point of use above ground, whereby it retains a substantial proportion of the heat energy absorbed in the cavern. Such energy is utilized in any suitable manner, one such preferred use being for the evaporation of brine extracted from the cavern during preparation thereof or obtained from neighboring salt deposits.

3,661,425

HEAVY-DUTY WHEEL

Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France

Filed Dec. 3, 1969, Ser. No. 881,741
Claims priority, application France, Dec. 11, 1968, 177772
Int. Cl. B60b *3/02*
U.S. Cl. 301—63 R **2 Claims**



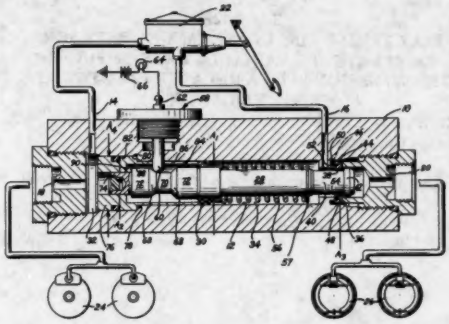
A wheel includes a well base rim, also known as a drop center rim, the well of which is offset from the median plane of the rim so as to be farther from one edge of the rim than from the other. The junction between the rim and the wheel disk is in the vicinity of the edge of the rim that is the farther from the well.

3,661,426

COMBINATION WARNING SWITCH AND PROPORTIONING VALVE

George M. Tam, South Bend, Ind., assignor to The Bendix Corporation

Filed June 1, 1970, Ser. No. 42,110
Int. Cl. B60t *8/26, 11/34, 17/22*
U.S. Cl. 303—6 C **11 Claims**



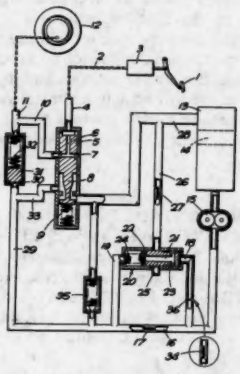
A valve for use in an automotive vehicle having two separate braking systems is disclosed which includes a piston slidable in a bore of a housing, dividing the latter into first and second compartments which are in fluid communication with a corresponding one of the vehicle's braking systems. A proportioning seal is provided in one of the chambers, and the piston cooperates with the seal to meter flow of fluid through the chamber, thereby establishing a lower level of fluid pressure on one side of the seal than that existing on the other side of the seal. When a malfunction causes a pressure loss in the other chamber, the piston is urged away from the seal to permit unrestricted flow of fluid through the latter.

3,661,427

BRAKING APPARATUS

Peter Charles Hodge, London, England, assignor to Simms Group Research and Development Limited, London, England

Filed Mar. 4, 1970, Ser. No. 16,286
Claims priority, application Great Britain, Mar. 6, 1969, 11,902/69
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F **7 Claims**



A braking system for a vehicle wheel which system comprises a reservoir, and a pump pumping liquid from the reser-

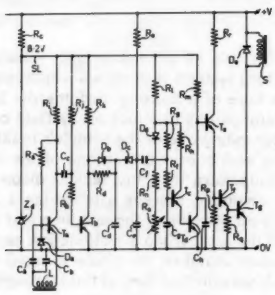
voir through a conduit and back to the reservoir in relation to the vehicle wheel speed. A progressively closable restriction is provided downstream of a connection to the brakes so liquid pressure upstream of the closable restriction may be increased to apply the brakes. A leakage conduit is provided to by-pass the closable restriction and the connection, and incorporates a variable restriction the opening of which increases with increased vehicle wheel speed.

3,661,428

ELECTRICAL CIRCUIT ARRANGEMENTS FOR CONVERTING A VARIABLE RATE OF PULSE TRANSMISSION INTO A RELATED ELECTRICAL OUTPUT QUANTITY

Denis Sharp, Crawley, Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,420
Claims priority, application Great Britain, Sept. 18, 1968, 44,276/68
Int. Cl. B60t *8/08, 8/12*
U.S. Cl. 303—21 CF **7 Claims**



An anti-lock vehicle brake control system comprising a wheel sensor for generating a train of pulses at a frequency proportional to the wheel speed. A switching transistor receives the pulses. A first capacitor is coupled to the output of the switching transistor via a first isolation diode. The switching transistor causes the first capacitor to charge up to a predetermined voltage level for each pulse received. A discharge circuit allows the first capacitor to discharge in the interval between successive pulses. A second capacitor is permanently connected to a source of charging current and is also coupled to the first capacitor via a second isolation diode so that the second capacitor will discharge towards the voltage level on the first capacitor to produce a voltage on the second capacitor that is proportional to wheel speed. The latter voltage is used to actuate a control valve in the vehicle brake fluid pressure system to relieve the braking pressure whenever said capacitor voltage exceeds a given value.

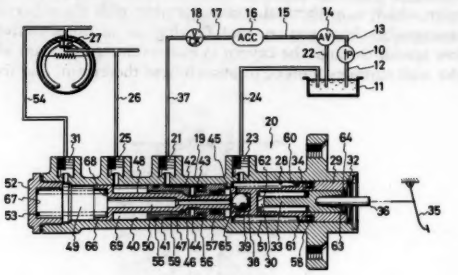
3,661,429

PRESSURE CONTROL DEVICE FOR HYDRAULIC BRAKE SYSTEM OF POWERED VEHICLES

Masahiro Kito, Nagoya, Japan, assignor to Aisia Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed Aug. 11, 1970, Ser. No. 62,823
Claims priority, application Japan, Aug. 26, 1969, 44/67412
Int. Cl. B60t *15/06*
U.S. Cl. 303—54 **5 Claims**

A pressure control device for hydraulic brake systems for use on powered vehicles wherein a pressure fluid passage from a powered pressure source such as an accumulator to the wheel cylinders is provided separately from a fluid passage through which the pressurized fluid is conveyed back from the wheel cylinders to a reservoir, so that the pressure



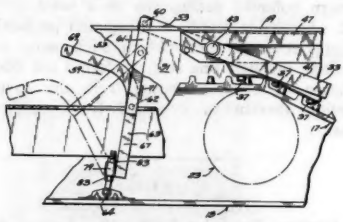
fluid is circulated in the brake system without returning through the same fluid passage.

3,661,430

BRAKE FOR A TRACK VEHICLE

Eldon W. Wooters, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed June 12, 1970, Ser. No. 45,617
Int. Cl. B62d *55/00*
U.S. Cl. 305—9 **8 Claims**



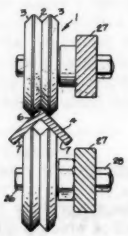
Disclosed herein is a vehicle including a track trained, in part, about a support mounted on a frame, and a brake shoe movable relative to a braking position in opposing relation to said support, and with said track between said support and said shoe, together with means on said frame for moving said brake shoe to and from said braking position.

3,661,431

GUIDE WHEELS AND TRACKS

Warren R. Wisecarver, Walnut Creek, Calif., assignor to Bishop-Wisecarver Corporation, Pittsburgh, Calif.

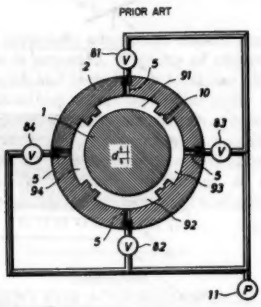
Filed Aug. 24, 1970, Ser. No. 66,388
Int. Cl. F16c *19/49*
U.S. Cl. 308—6 R **6 Claims**



Guide wheels with eccentric adapter bushings to provide precision attachment relatively to tracks. Each guide wheel is

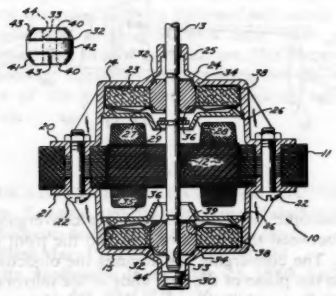
formed in a double V which provides four inclined circular surfaces permitting use both in horizontal and vertical position and adapted to co-operate with tracks of suitable angles both by the enclosed central groove and by the two outside inclined annular surfaces. The eccentric nut and bolt permits the accurate shifting of the wheel for precision adjustment. The mounting surfaces of the track are accurate and held to close tolerances and are interchangeable.

3,661,432
HYDROSTATIC BEARING ASSEMBLY
Kenzo Aihara, Tokyo, Japan, assignor to Ikegai Tekko Kabushiki Kaisha (Ikegai Iron Works, Ltd.), Tokyo, Japan
Filed Feb. 22, 1971, Ser. No. 117,459
Claims priority, application Japan, Feb. 26, 1970, 45/16573
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **3 Claims**



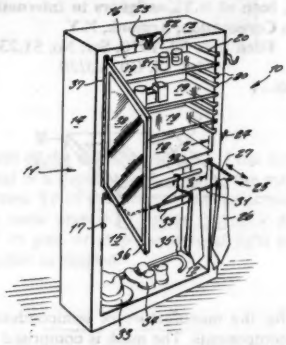
A hydrostatic bearing assembly in which an externally pressurized fluid is pumped to completely separate the bearing from the object which it supports; by utilizing the elastic deformation of a portion of the bearing itself, the flow rate of the pressurized fluid is controlled, and any increase in the pressure in that pocket which is subjected to the load serves to reduce the amount of the passage of this fluid from said pocket as a result of the elastic deformation of the bearing, and thus, the load supporting characteristics of the bearing is improved.

3,661,433
SELF-ALIGNING BEARING
John R. Schuster, Elyria, Ohio, assignor to The General Industries Company, Elyria, Ohio
Filed Jan. 19, 1970, Ser. No. 4,000
Int. Cl. F16c *9/06*
U.S. Cl. 308—72 **5 Claims**



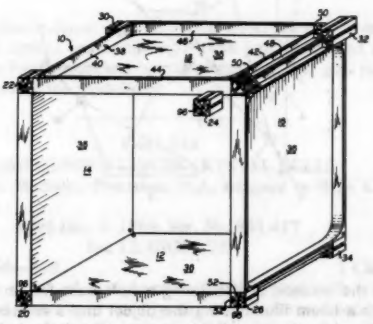
There is disclosed herein a self-aligning bearing for electric motors and the like which embodies a spherical bearing member mounted for universal movement and having an axial opening to accomodate the motor shaft, the bearing having lubricating return grooves across the axially directed ends thereof, said grooves extending partway into the spherical side surface portions of the bearing.

3,661,434
UNITARY MODULAR SHELVING STRUCTURE
Ralph Alster, 2 Washington Square Village, New York, N.Y.
Filed May 28, 1970, Ser. No. 41,361
Int. Cl. F16b *12/02*
U.S. Cl. 312—111 **12 Claims**



A unitary modular shelving structure comprised of a plurality of plate-like members. The plate-like members are assembled into the unitary modular structure, which may comprise one or more modules, by means of hollow rectangularly configured connectors, or clips, having a plurality of peripherally arranged, equiangularly spaced congruent grooves which are complementary to tongue-like protrusions extending from the modular plate-like member outer walls. The connectors may be common junction points for adjacent modules which may be connected to form a unitary structure comprising a plurality of modules. Threaded members, such as screws, may be utilized to provide additional strength to the unitary structure. Various members may be inserted in portions of the assembled plate-like members so as to alter the structural appearance of the completed structure and/or to add additional utility.

3,661,435
TIE AND DRESSING CABINET
Vivian June Miller, 601 Main Street, Rising Sun, Ind.
Filed Oct. 20, 1969, Ser. No. 867,465
Int. Cl. A47b *77/08*
U.S. Cl. 312—321 **4 Claims**



A cabinet for the storage of neckties and other apparel, the cabinet comprising a case including an upper compartment

containing adjustable shelves for supporting various items, the compartment being lighted by an electric lamp, and a lower compartment containing a forwardly slidable tie rack, a garment hanger bar and a space for the placement of various objects such as a hat, shoes and a cane.

3,661,436

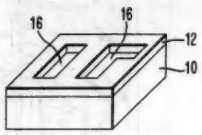
TRANSPARENT FABRICATION MASKS UTILIZING MASKING MATERIAL SELECTED FROM THE GROUP CONSISTING OF SPINELS, PEROVSKITES, GARNETS, FLUORIDES AND OXY-FLUORIDES

Ronald S. Horwath, Salt Point, and Varadachari Sadagopan, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,237

Int. Cl. G02b *5/20*

U.S. Cl. 350—1 **16 Claims**



A mask for the manufacture of semiconductor and other very small components. The mask is comprised of patterns of multi-component oxides and fluorides, such as spinels, perovskites, and garnets. In general, the materials are harder than the components being manufactured and are opaque to the wavelength used in photoresist techniques, while being transparent to the visible wavelengths. Materials with an energy gap between approximately 2.8 eV and 5 eV satisfy these optical properties, a particular example being $GaFeO_3$. These masks are not damaged by surface defects on the components and can be visually aligned.

3,661,437

METHOD FOR PRODUCING HOLOGRAMS OF MOVING OBJECTS

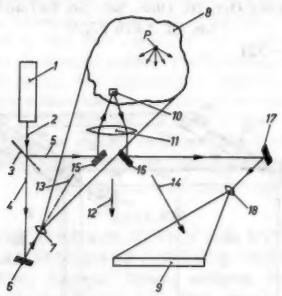
Francois Mottier, Zurich, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed June 22, 1970, Ser. No. 48,177

Claims priority, application Switzerland, July 2, 1969, 10120/69

Int. Cl. G02b *27/22*

U.S. Cl. 350—3.5 **3 Claims**



In the method of producing a hologram for an object in which a beam illuminating the object and a reference beam produced by the same light source establish the hologram by interference in a hologram plate between the reference beam and light coming from the object, any inadvertent movement of the object during the exposure time is compensated out by conducting one of the beams over a reflecting surface in the form of a small mirror located on the object in such manner that the difference between the mean path lengths of the rays of the object illuminating beam and of the light from the object to the hologram plate on the one hand, and that of the reference beam on the other hand, remains substantially constant.

3,661,438

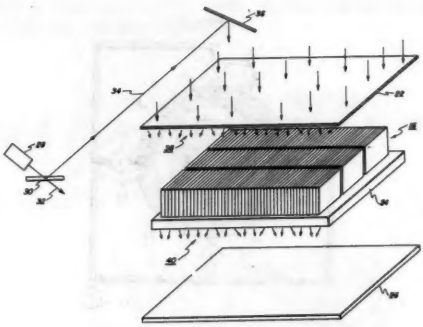
HOLOGRAPHIC DATA STORAGE AND RETRIEVAL SYSTEM

Nicholas K. Sheridon, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,418

Int. Cl. G02b *27/22*

U.S. Cl. 350—3.5 **13 Claims**



A holographic data storage and retrieval system, wherein by stacking a plurality of surface recorded flat base members and by edge illumination thereof by a coherent light source, a high density holographic image of the plurality of stacked base members can be produced. For readout a similar coated base member would be utilized in the presence of a reconstructing coherent light source to form a readable output image on a surface coating on said base member.

3,661,439

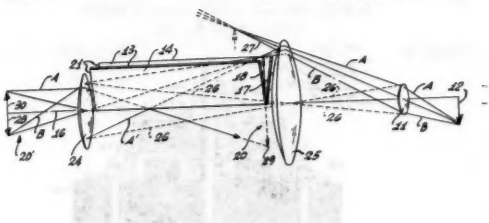
TELESCOPIC KALEIDOSCOPE

John L. Burnside, III, and Henry Hay, both of P. O. Box 8, San Juan Pueblo, N. Mex.

Filed Oct. 30, 1970, Ser. No. 85,375

Int. Cl. G02b *27/08*

U.S. Cl. 350—4 **24 Claims**



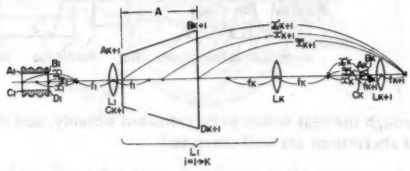
A telescopic kaleidoscope having a converging lens positioned between the objective lens and the front ends of the mirrors. The converging lens focuses the objective lens centrally on the plane of the rear ends of the mirrors to provide substantially equal illumination of the kaleidoscope image array. The array can be projected onto a screen by a projection lens and the kaleidoscope can be used as an attachment for a camera or a projector.

3,661,440

MICROSCOPE FOR INSPECTING SURFACES OF HOLES OR THE LIKE

Kinji Takahashi, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 12, 1970, Ser. No. 10,914
Claims priority, application Japan, Feb. 17, 1969, 44/11017
Int. Cl. G02b *21/00, 23/00*
U.S. Cl. 350—8 5 Claims



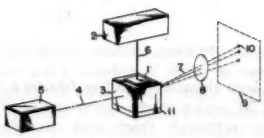
A microscope especially adapted to inspect the surfaces of holes or the like is provided. A group of objectives having shorter focal lengths and including at least one objective having a magnification less than one-half in order to form an image reduced in size is combined with an eyepiece having a shorter focal length, thereby forming a magnified image. Because of the difference in magnifications at both ends of an increased depth of field, the image is exceedingly distorted so as to permit the inspection of surfaces of holes or the like.

3,661,441

ARRANGEMENT FOR ACOUSTO-OPTICAL LIGHT DEFLECTION

Naoya Uchida, Tokyo; Yoshiro Ohmachi, Tokorozawa; Nobukazu Niizeki, Tokyo, and Takahiro Inamura, Yamato, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 27, 1970, Ser. No. 84,450
Claims priority, application Japan, Nov. 21, 1969, 44/92913
Int. Cl. G02f *1/24*
U.S. Cl. 350—149 24 Claims



There has been disclosed a novel use of single crystal paratellurite, that is, tellurium dioxide TeO_2 as a medium for acousto-optical light deflection. The light deflecting medium of the present invention enables light and ultrasonic waves passing therethrough to interact with each other with a higher efficiency than that of the prior art. The present light deflecting medium displays various effects by the several combinations of the propagation directions of light and acoustic waves.

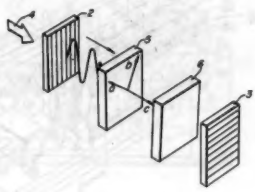
3,661,442

ELECTRICALLY OPERATED OPTICAL SHUTTER

Akio Kumada, Kodaira, and Masashi Koga, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1970, Ser. No. 20,244
Claims priority, application Japan, Mar. 25, 1969, 44/22094
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 12 Claims

An optical shutter comprising a pair of crossed polarizing means, and at least one double-refractive crystal and at least one Z-cut irregular ferroelectric crystal both interposed between the pair of crossed polarizing means, the said crystal having equal retardations, the value of the resulting retardation R of the crystals in the open position of the shutter being $80 \leqq R \leqq 320$ or $R \geqq 2000$, whereby a field at least equal



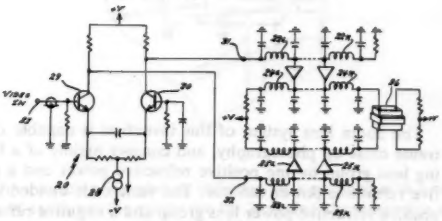
to the magnitude of the coercive field E_c f the irregular ferroelectric crystal or a stress at least equal to the magnitude of the coercive stress Tc of the irregular ferroelectric crystal is applied to the same crystal to rotate the optic axial plane thereof by 90° to pass or stop the natural light transmitted through the shutter as desired.

3,661,443

100 MEGAHERTZ BANDWIDTH MODULATOR DRIVER

William C. Harris, Oxford, Conn., and Frank A. Magnante, Yorktown Heights, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 7, 1970, Ser. No. 61,888
Int. Cl. G02f *1/28;* H03f *3/26*
U.S. Cl. 350—160 R 1 Claim



A modulator driver apparatus for controlling a crystal-modulated optical beam utilizing a push pull distributed amplifier to achieve wideband operation and a power gain sufficient to operate the modulator.

3,661,444

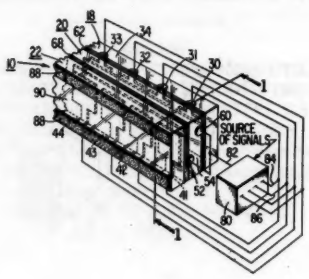
COMPOUNDED LIQUID CRYSTAL CELLS

Dennis Lee Matthies, Princeton, N.J., assignor to RCA Corporation

Filed Dec. 2, 1969, Ser. No. 881,417
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 1 Claim

A linear array of compounded liquid crystal cells comprises a first plurality of linearly aligned cells formed between the opposite surfaces of a pair of parallel plates and a second plurality of linearly aligned (compounding) cells formed between a surface of one of the pair of plates and a third

parallel plate. The cells are filled with liquid crystals, and each liquid crystal cell is defined by a pair of oppositely



disposed light-transmitting electrodes on the opposite surfaces, respectively, of the plates that form the cell.

3,661,445

ZOOM LENS SYSTEM

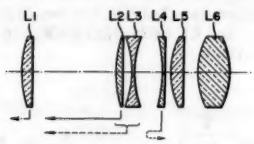
Atsushi Someya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 29, 1970, Ser. No. 50,675

Claims priority, application Japan, July 12, 1969, 44/54834

Int. Cl. G02b *15/18, 15/16, 15/14*

U.S. Cl. 350—186 **2 Claims**



The zoom lens system of this invention is capable of extreme close-up photography, and consists mainly of a focusing lens group having positive refractive power and a negative refractive power variator. The variator is divided into a positive refractive power lens group and a negative refractive power lens group. In phototaking from the infinity to a normal distance, said focusing lens group is shifted for focusing and for focusing a subject located closer than said normal distance, the variator is held in telephoto position and then the positive refractive power lens group of the variator is shifted forward for focusing.

3,661,446

HIGH MAGNIFYING POWER DRY OBJECTIVE MICROSCOPE

Ikuo Mori, and Keiji Matsuki, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

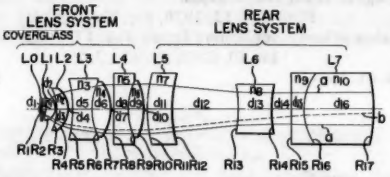
Filed Sept. 2, 1970, Ser. No. 68,898

Claims priority, application Japan, Sept. 6, 1969, 44/70313

Int. Cl. G02b *21/02*

U.S. Cl. 350—214 **1 Claim**

A high magnifying power dry objective for a microscope capable of a magnifying power of 100×, numerical aperture of 0.9 and working distance 1.9f, where f is the compound focal length of the objective, and which consists of 10 elements in seven groups. The first lens is a positive meniscus whose concave surface faces toward a specimen so that the light rays from the object point on the optical axis traverses



through the rear lenses to be refracted suitably, and the optical aberrations are well corrected.

3,661,447

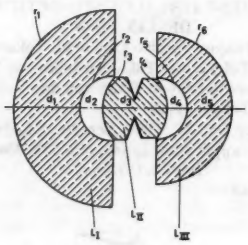
THREE LENS ELEMENT WIDE ANGLE OBJECTIVE

Erhard Glatzel, Heidenheim/Brenz, Germany; Hans Schulz, deceased, late of Hunibach, Switzerland; Ris Ruth, Im Gehrli 77, Altreu/Selzach, and Heinz-Dieter Schulz, Ch 3762 Erlenbach i. S., both of Germany (heirs)

Continuation-in-part of application Ser. No. 669,463, Sept. 21, 1967. This application Apr. 13, 1970, Ser. No. 28,022

Int. Cl. G02b *9/12*

U.S. Cl. 350—225 **3 Claims**



A three lens element objective having a wide picture angle of about 120° and a relative aperture of about 1:8 and comprising two relatively thick and strongly meniscus-shaped dispersive lens elements between which is arranged with axial air spaces a relatively thick collective lens element.

3,661,448

MOTION PICTURE CAMERA WITH MEANS PRODUCING A DISSOLVING EFFECT

Heinz Thiele, Leinfelden (Wurtt.), and Dietrich Becker, Stuttgart-Mohringen, both of Germany, assignors to Zeiss Ikon Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 16, 1970, Ser. No. 29,059

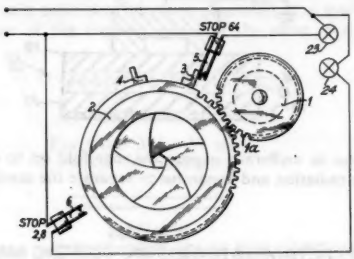
Claims priority, application Germany, Apr. 22, 1969, P 19 20 439.8

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **3 Claims**

A motion picture camera having a motor operated adjustable diaphragm for the purpose of producing a dissolving effect is provided with means which gradually closes and again opens the diaphragm from an exposure aperture to the smallest aperture and vice versa and during this time period the film gripper withdraws a predetermined length of film from

the delivery spool and after exposure moves the film back onto the delivery spool. The forward and rearward movement of the film takes place in relation to the decrease of the diaphragm aperture and the subsequent increase of the same.

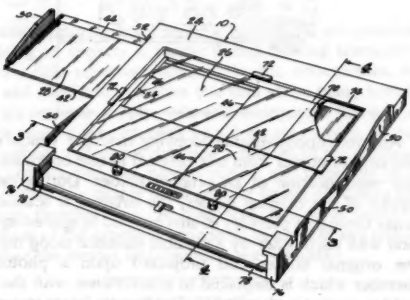


3,661,449

OVERHEAD VISUAL SHUTTER DEVICE

John S. Wright, 6115 North Lake Drive Court, Milwaukee, Wis.

Filed May 19, 1969, Ser. No. 825,902
Int. Cl. G03b *21/14*
U.S. Cl. 353—88 **10 Claims**



An overhead projector shutter assembly having a frame defining a window and a number of slides movably mounted in the frame to mask the window, the slides being selectively and relatively movable to mask and unmask selected portions of the window or the entire window to project selected portions of the total transparency onto a screen in sequence. The slides are overlapped with each other and with the frame along adjacent edges to completely exclude unwanted light and to promote smoothness of operation on guides which assure accuracy of alignment between the slides and the register pins which locate the transparency.

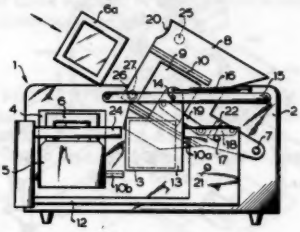
3,661,450

PHOTOGRAPHIC SLIDE PROJECTORS

Gerhard Brinkmann, and Frohmut Muller, both of Braunschweig, Germany, assignors to Voigtlander Aktiengesellschaft, Braunschweig, Germany

Filed Sept. 22, 1969, Ser. No. 859,683
Claims priority, application Germany, Mar. 22, 1969, P 19 14 700.3
Int. Cl. G03b *23/04*
U.S. Cl. 353—92 **1 Claim**

A photographic slide projector wherein a slide-changer is adapted to shift slides successively from a magazine to a projecting position and then back to the magazine. When each slide is in the projecting position it is held by a slide-holder, and this holder is supported for swinging movement by the housing of the projector. In this way, when the slide-holder is swung outwardly it is accessible to manually receive a slide which then can be manually removed therefrom. On the other hand, the slide-holder can remain in an operative position where it will receive a slide from the slide-changer and return a slide thereto.

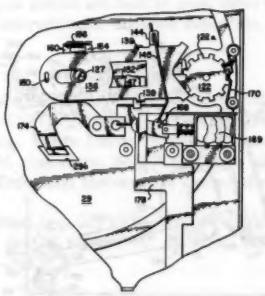


3,661,451

SLIDE PROJECTOR INDEXING MEANS

Walter J. Hall, Chicago, Ill., assignor to GAF Corporation, New York, N.Y.

Original application Nov. 20, 1967, Ser. No. 684,202, now Patent No. 3,499,708, which is a continuation-in-part of application Ser. No. 554,071, May 31, 1966. Divided and this application July 30, 1969, Ser. No. 872,788
Int. Cl. G03b *23/06*
U.S. Cl. 353—117 **3 Claims**



The magazine includes an indexing gear engaged with a series of teeth on the projector for indexing the magazine in forward and reverse directions. The indexing gear is rotated in either direction by indexing means in the projector, such indexing means including a locking member which is yieldably urged into its locked position and positively withdrawn to an unlocked position. The projector also includes an operating member or "Load" button. When this member is depressed, the indexing means are disabled and a latch is withdrawn permitting separation of the magazine from the projector.

3,661,452

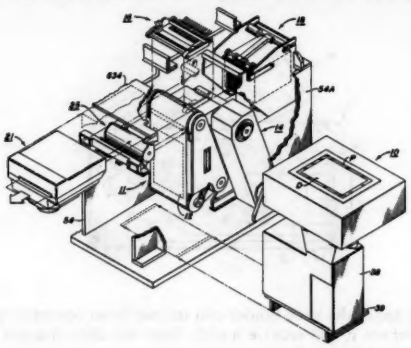
XEROGRAPHIC REPRODUCTION MACHINE

Ellsworth D. Hewes, Rochester, and Norbett H. Kaupp, Newark, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 24, 1968, Ser. No. 731,934
Int. Cl. G03b *27/10*
U.S. Cl. 355—3 **5 Claims**

A reproduction machine having a photoreceptor imaging medium in belt configuration which is exposed by a flash illumination system in timed relation to the feeding of sheets of

copy paper prior to image transfer. The belt is arranged to be maintained flat during exposure and development with image



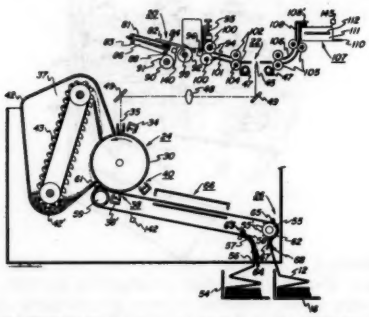
transfer being effected along a curved presentation of the belt between the two flat sections of the belt.

3,661,453

ELECTROSTATIC LABEL PRINTER

John V. McGuire, Deerfield; Donald W. Watson, Arlington Heights; Albert G. Enskat, Barrington, and Herbert C. Artelt, Jr., Wildwood, all of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed June 22, 1970, Ser. No. 48,362
Int. Cl. G03g *15/00*; B65h *1/06*
U.S. Cl. 355—3 2 Claims



A device is provided for electrostatically printing label information, normally addresses, taken from individual master address cards on a web material for use as an addressing form. The device has a photoconductive member, a scanning station, transport components for feeding the cards forward in shingled relation past the scanning station; a station for developing latent images from the card information on the member; a transfer station, transport components to advance the web material to the transfer station; and a fixing station to fix the transferred image on the web material.

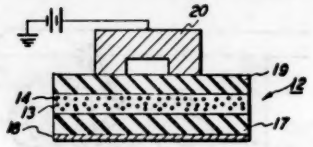
3,661,454

COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING

Harold Ernst Clark, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Original application Jan. 9, 1967, Ser. No. 608,157, now Patent No. 3,573,904. Divided and this application Feb. 2, 1970, Ser. No. 12,499
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 2 Claims

An apparatus for manifold imaging comprising apparatus to apply an imagewise electric field across a manifold set, apparatus to uniformly expose the manifold set to electromagnetic radiation and apparatus to separate the manifold set.

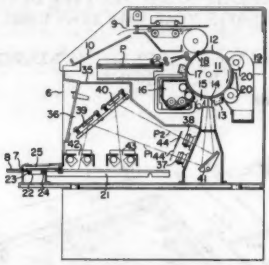


3,661,455

ELECTROPHOTOGRAPHIC COPYING MACHINE

Ryoichi Namiki, Tokyo, and Masao Ariga, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1971, Ser. No. 119,192
Claims priority, application Japan, Mar. 2, 1970, 45/19548
Int. Cl. G03g *15/04*
U.S. Cl. 355—14 4 Claims



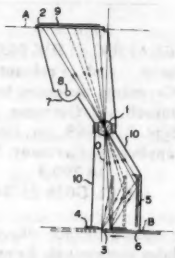
An electrophotographic copying machine which makes a plurality of copies from one original in one operation, that is one reciprocation of an original holder. During one going stroke of the original holder, the original is scanned many times through a plurality of slits arrayed in spaced-apart relation with each other by a suitable distance along the path of the original holder and projected upon a photosensitive member which is displaced in synchronism with the original holder, so that a plurality of electrostatic latent images of the same original may be formed upon the sensitive member.

3,661,456

SLIT EXPOSURE OPTICAL SYSTEM

Shigeru Suzuki, Yokohama-shi, Japan, assignor to Kabushiki Kaisha Ricol, Tokyo, Japan

Filed Feb. 25, 1969, Ser. No. 802,023
Claims priority, application Japan, Feb. 29, 1968, 43/13080
Int. Cl. G03b *27/70*
U.S. Cl. 355—66 1 Claim



A slit exposure optical system in which an original is held in position on one side of a photocopying lens while a copy-

ing paper is arranged to move on the other side of said lens; a reflecting mirror is disposed at a right angle to the copying paper and a slit is arranged to contact with the copying paper; and said reflecting mirror is displaced at a speed of one-half that of the copying paper in the same direction therewith.

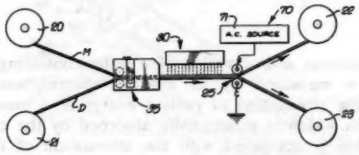
ERRATUM

For Class 355—37 see:
Patent No. 3,661,461

3,661,457
ELECTROSTATIC REGISTRATION FOR CONTACT PRINTING

Roger A. Frech, Spring Valley, Calif., assignor to Extek Microsystems, Inc., Van Nuys, Calif.

Filed Mar. 6, 1970, Ser. No. 17,244
Int. Cl. G03b *27/02*
U.S. Cl. 355—78 **11 Claims**

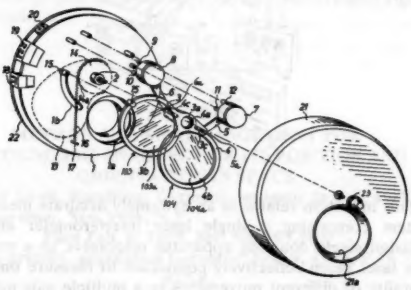


A contact printing apparatus for accurately and precisely maintaining in registry a master image-bearing transparent film and a light-sensitive duplicate. In one embodiment, the master and duplicate comprise two film strips being initially wound on separate supply reels and transported through an exposure zone to take-up reels by a drive mechanism. A pair of high voltage rollers are disposed upstream of the exposure zone in contact with the moving master and duplicate so as to electrostatically charge them causing strong attraction and adherence therebetween. A discharge device is provided downstream of the exposure zone so as to prevent any scintillation when the master and duplicate are separated.

3,661,458
PHOTOGRAPHIC COPYING APPARATUS

Ewald Fred Noemer, Dumont, N.J.; Franz J. Kau, Spring Valley, and Heinz Ludemann, Pearl River, both of N.Y., assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 25, 1970, Ser. No. 49,843
Claims priority, application Germany, June 28, 1969, G 69 30 562.0
Int. Cl. G03b *27/04*
U.S. Cl. 355—88 **10 Claims**

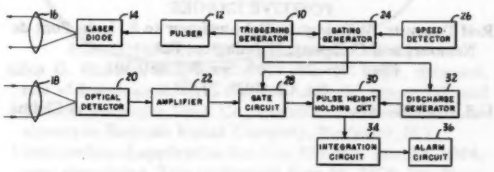


A photographic copying apparatus wherein the shutter blade is moved to open position by the frames of color filters whenever a filter pivots in a direction to move out of registry with the light-admitting opening. The filters are pivoted by rotary electromagnets which are deenergized when the respective filters extend across the path of incoming light. The shutter blade is biased to closed position and is pivotable about the common axis of the filters.

3,661,459
SYSTEM FOR PREVENTING COLLISION OF VEHICLES

Masao Aoki, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed Sept. 10, 1970, Ser. No. 70,996
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **2 Claims**

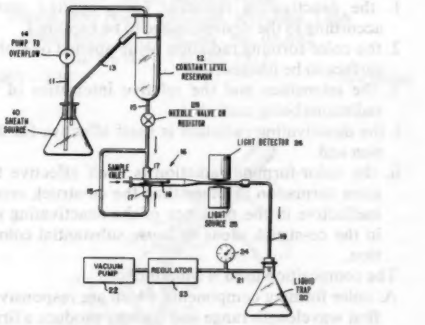


A motor vehicle sends a train of laser light pulses with a fixed repetition period and receives the pulses reflected from a preceding vehicle. The received pulses are converted to an electrical signal and applied to a gate circuit gated with the repetition period of the laser light pulses and with a time delay determined by the speed of the vehicle. Those signal portions resulting from the received pulses and passed through the gate circuit are held in peak value and integrated providing an intervehicular distance indication.

3,661,460
METHOD AND APPARATUS FOR OPTICAL ANALYSIS OF THE CONTENTS OF A SHEATHED STREAM

Alan H. Elking, White Plains; Warren Groner, Whitestone, and Alex M. Saunders, Bedford Village, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 28, 1970, Ser. No. 67,819
Int. Cl. G01n *1/00, 15/02, 21/06*
U.S. Cl. 356—36 **19 Claims**



There is provided a method and apparatus for optical analysis by photometry of a substance flowing in a liquid stream within a coaxial sheath stream of a transparent liquid. The sheath stream, flowing in the same direction, entrains the inner stream so as to confine it concentrically. A photometer is used which includes a light source on one side of the sheathed stream in a position to direct light onto the inner stream which is cylindrical, the outer or sheath stream also

being cylindrical. The photometer also includes a light detector externally of the sheathed stream in an angular position to detect the photometric results of impingement of light on the contents of the inner stream. Refraction of light at the interfaces of the sheath stream is compensated by varying the radius of the inner stream through the control of the flow of one stream with reference to the other.

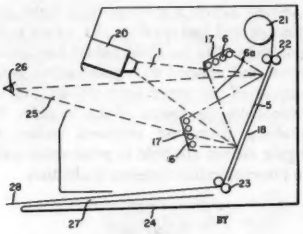
The concept also includes the narrowing of the sheathed stream to a very small diameter in which it is confined by a wall structure in the area of examination.

3,661,461

CO-IRRADIATION SYSTEM FOR PRODUCING POSITIVE IMAGES

Rolf Dessauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 26, 1969, Ser. No. 880,301
Int. Cl. G03b 27/76
U.S. Cl. 355—37 6 Claims



Method for producing positive images by irradiating photoimageable and photodeactivatable compositions which are characterized by forming color on irradiation with light in a first wavelength range and by being deactivated against color formation on irradiation with light in a different second wavelength range. The method comprises simultaneously exposing such composition disposed as an image-capture surface to radiations in both wavelength ranges, with

1. the deactivating radiation being applied patternwise according to the desired image to be captured,
2. the color-forming radiation being applied over the entire surface to be imaged, and
3. the intensities and the relative intensities of the two radiations being such that

i. the deactivating radiation is itself effective for deactivation and

ii. the color-forming radiation is itself effective to cause color formation in other than the co-struck areas but is ineffective in the presence of the deactivating radiation in the co-struck areas to cause substantial color formation.

The composition used is a mixture of

A. color forming components which are responsive to said first wavelength range and thereby produce a first photoinduced oxidation-reduction reaction, and

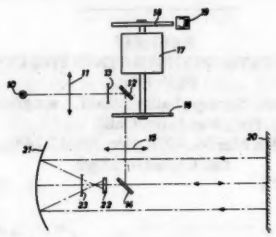
B. deactivating components which are responsive to said second wavelength range and thereby produce a deactivating agent by a second oxidation-reduction reaction, said deactivating agent thus produced being a stronger reducing agent than the reductant member of the color-forming components and thereby preventing the color-forming reaction when the composition is subsequently exposed to the first wavelength range.

3,661,462

SPECTROPHOTOMETER FOR MEASURING THICKNESS OR WEIGHT OF WATER-CONTAINING COATINGS

Luc Yves Natens, Berchem, Belgium, assignor to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Apr. 23, 1970, Ser. No. 31,189
Claims priority, application Great Britain, Apr. 23, 1969, 20,766/69
Int. Cl. G01m 21/34; G01j 3/42
U.S. Cl. 356—51 9 Claims



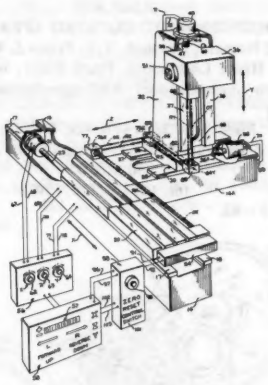
The thickness and/or weight of a water-containing composition is measured by an infrared spectrophotometer wherein the attenuation of radient energy at a measuring wavelength which is substantially absorbed by the coating composition is compared with the attenuation of radient energy at a second reference wavelength not substantially absorbed by the coating composition.

3,661,463

SINGLE INTERFEROMETER MULTIPLE AXIS LASER MEASURING SYSTEM

Wallace E. Brainard, New Berlin, and Charles B. Sipek, Hales Corners, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

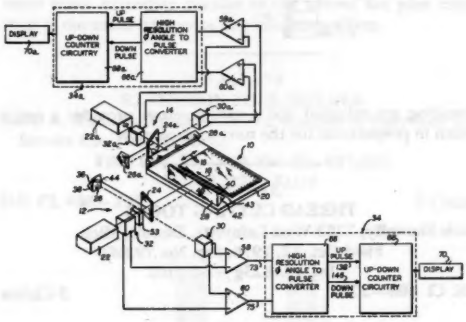
Filed Mar. 5, 1970, Ser. No. 16,848
Int. Cl. G01b 9/02; G02b 7/18
U.S. Cl. 317—106 21 Claims



This invention relates to an extremely accurate measuring system comprising a single laser interferometer and associated single counting apparatus responsive to a multiple axis laser beam reflectively connected to measure one of a plurality of different movements in a multiple axis machine tool. Preferably, the measuring apparatus is incorporated in a machine tool having a frame provided with a worktable movable along an X axis relative to an upright column mounted on the frame for transverse movement along a Z

axis. The upright is disposed to carry a spindle head for movement along a vertical or Y axis to effect selective movement of a cutter relative to an associated workpiece mounted on the worktable in the usual manner.

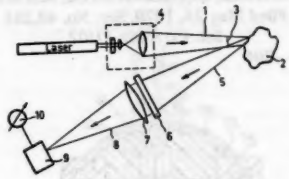
3,661,464
OPTICAL INTERFEROMETER
Charles J. Hubbard, Huntington, N.Y., assignor to Jorway Corporation, Westbury, N.Y.
Filed Mar. 16, 1970, Ser. No. 19,632
Int. Cl. H01s *9/02*; G06f *7/38*
U.S. Cl. 356—106 **35 Claims**



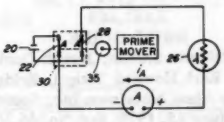
An optical interferometer of the coherent light type with which distances are measured by counting the total number of interference fringes produced when one reflector of a pair in the interferometer is moved through the distance to be measured. The movable reflector which is also translatable normal to the direction of measurement, is a roof prism having its reflective surfaces elongated in this direction. Photoelectric detectors are provided on opposite sides of a beam splitter for each providing a pair of phase displaced sinusoidal interference signals. The outputs of the detectors are combined to produce a single pair of phase displaced sinusoidal interference signals having an average D.C. level of zero volts. Electronic logic circuitry is provided for producing a digital signal representing the amount and direction of the displacement of the movable reflector along the axis of measurement. This circuitry includes a weighted summing means, including an operational amplifier, for providing at least one sinusoidal signal pair from the combined detector outputs, which is a weighted sum of these outputs and which is squared by Schmitt triggers and combined with these outputs in accordance with a predetermined signal pair condition.

3,661,465
METHOD AND AN ARRANGEMENT FOR RECOGNIZING AN OBJECT OR ITS POSITION AND ORIENTATION IN SPACE
Gunther Groh, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 6, 1969, Ser. No. 797,103
Claims priority, application Germany, Feb. 9, 1968, P 16 73 927.8
Int. Cl. G01b *11/00*
U.S. Cl. 356—162 **9 Claims**

A method and apparatus for determining the positional changes in the surface of an object by recording a real image and speckle pattern produced by focusing the radiation scattered by the object from a coherent source, and by comparing the object with the recorded image and the resulting speckle pattern.

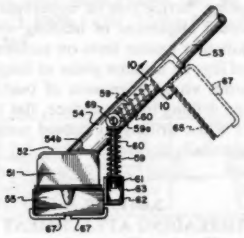


3,661,466
PHOTOMETRIC SYSTEM FOR CAMERAS
Allen G. Stimson, Brighton, N.Y.; John H. Eagle, deceased, late of Irondequoit, N.Y. (by Lee A. Eagle, executrix), and Lincoln Rochester Trust Co., executor, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of application Ser. No. 337,454, Jan. 13, 1964, now abandoned. This application June 25, 1970, Ser. No. 49,760
Int. Cl. G01j *1/34, 1/36, 1/40*
U.S. Cl. 356—217 **5 Claims**



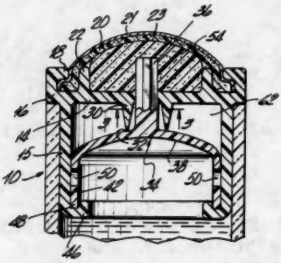
An exposure control system which automatically compensates for variations in background lighting by exposing a single photocell alternately to the subject and then to the background. A reversing switch is operated synchronously with the means for alternating the exposure of the photocell in such a manner to reverse the direction of the current through the exposure control synchronously with the alternation of the photocell exposure to the scene.

3,661,467
MOP WITH RESERVOIR
Gerald J. Dalton, 459 North 250 East, Kaysville, Utah
Filed Aug. 20, 1970, Ser. No. 65,642
Int. Cl. A47l *13/146, 13/22*
U.S. Cl. 401—138 **6 Claims**



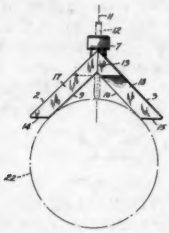
A sponge mop having a firm backed scrubbing surface and a mopping face on a sponge head and means whereby dirty water accumulated by the sponge head during mopping is pressed from the sponge head into a mop reservoir from which it may be poured into an available receptacle.

3,661,468
FLUID APPLICATOR HAVING WINE-CUP SHAPED VALVE ASSEMBLY
Gilbert Schwartzman, 20 Wilmont Circle, Scarsdale, N.Y.
Filed May 25, 1970, Ser. No. 40,261
Int. Cl. A46b 11/02
U.S. Cl. 401—206 4 Claims



A fluid applicator having a wine-cup shaped valve assembly. The valve assembly provides a two-point fluid control arrangement with the cup being disengaged from its valve seat to permit fluid flow through the opening onto a compressed body and thence onto a cover. Flexure of the cup will disengage the cup from engagement with a projecting portion so as to permit fluid flow through suitable apertures into a reservoir space.

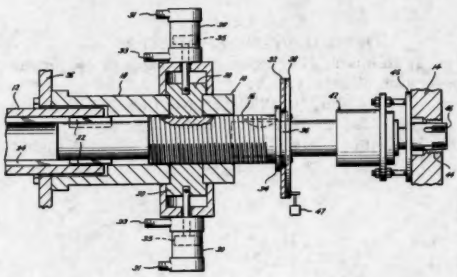
3,661,469
DRILL GUIDE
Millard Leff, Whitehouse Station; Joseph Daniel Malazinsky, Middlesex, and Earl Howard Weigel, Bridgewater, all of N.J., assignors to Ajem Associates, Inc., Somerville, N.J.
Filed June 15, 1970, Ser. No. 46,301
Int. Cl. B23b 49/02
U.S. Cl. 408—72 5 Claims



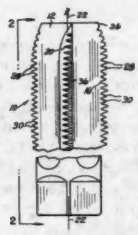
Drill guide bushing supported on legs with inner surfaces defining angle bisected by longitudinal axis of bushing and with flat coplanar bottoms in plane perpendicular to longitudinal axis of bushing. Scribe line on apparatus bisecting sand angle permits visual alignment of bushing with one of two mutually perpendicular center lines on surface to be drilled. Selected edges of legs lie in same plane as longitudinal axis of bushing and permit visual alignment of bushing with other center line. When drilling in flat surface, flat bottoms of legs contact surface. When drilling in curved surface, inner surfaces of legs tangentially contact surface.

3,661,470
THREADING ATTACHMENT
Arthur F. O'Pry, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.
Filed June 1, 1970, Ser. No. 41,827
Int. Cl. B23g 1/16, 1/18, 1/46, 5/16
U.S. Cl. 408—137 1 Claim

A threading attachment for connection to a rotary power takeoff for providing a thread on a workpiece wherein a pair of threaded nuts are actuated to engage a lead screw to drive a thread cutting means towards the workpiece and after threading are released and a spring return provides a quick return in preparation for the next workpiece.



3,661,471
THREAD CUTTING TOOLS
Louis Simonffy, 7253 West Lafayette, Detroit, Mich.
Filed Oct. 12, 1970, Ser. No. 79,841
Int. Cl. B23g 5/04, 5/06
U.S. Cl. 408—220 3 Claims

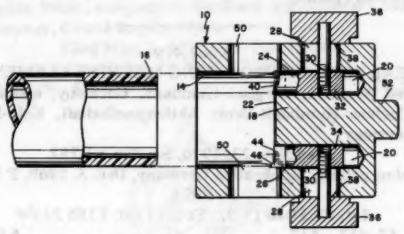


Tools for cutting threads in certain extremely hard materials like the aluminum bronzes, such tool being characterized by four lineal arrays of teeth equally spaced around a longitudinal axis and substantially equidistant therefrom. One pair of said arrays has a series of long teeth interspersed with a series of short teeth, and the other such pair has teeth of uniform length which are slightly shorter than the long teeth in the first mentioned arrays. An inwardly inclined chip clearance surface on each tooth extends rearwardly to a point below the root of the tooth. A flat cutting face on the teeth in each pair of lineal arrays extends below the root thereof, and is disposed at substantially right angles to a transverse medial plane through the other pair of lineal arrays.

3,661,472
FACING AND DEBURRING HANDTOOL
Ronald A. Beauloye, 2217 La Cresta Road, El Cajon, Calif.
Filed Feb. 8, 1971, Ser. No. 113,155
Int. Cl. B23b 5/16
U.S. Cl. 408—231 4 Claims

A handtool for facing off and deburring the rough cut ends of plastic pipe, the cutting tool bit structure being mounted parallel to the work-receiving bore and being adjustable by projecting knobs which are also handles to aid the user in rotating the handtool while pressing the same onto the pipe, the casing of the handtool having a work-receiving bore and

a thick block-like portion closing one end of the bore and providing support for the cutting tool bits in the form of

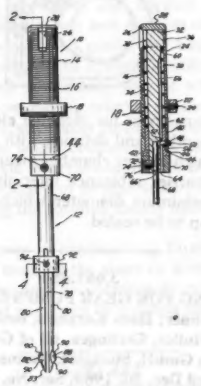


small bores extending parallel to the axis of the pipe rather than in the usual transverse or radial disposition.

3,661,473
EXTENSION TOOL HOLDER

Louis A. Kubicek, Ypsilanti, Mich., assignor to Burr-Ban Tool Service Co., Detroit, Mich.

Filed Dec. 22, 1969, Ser. No. 887,060
Int. Cl. B23b *51/16*
U.S. Cl. 408—239 **5 Claims**



An extension tool holder having a cylindrical outer housing adapted to be inserted into a chuck of a rotary drive machine. A tool holding rod is axially slidably mounted in a bore formed in the housing for rotation about its axis of elongation. A coil spring disposed within the bore around the rod biases the rod into the bore. During the back-stroke of the machine chuck, in the deburring of holes the coil spring compresses due to the engagement of the cutting edge of the deburring tool and the edge of the hole being deburred, allowing the deburring tool to delay at the edge of the hole to adequately deburr the workpiece.

3,661,474
LIQUID BOOSTER DEVICE

Leonard J. Sieghartner, Rock Island, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.

Filed Feb. 10, 1970, Ser. No. 10,279
Int. Cl. F04d *1/00, 1/06*
U.S. Cl. 415—143 **2 Claims**

A liquid booster device integrally formed with a turbine pump for delivering a liquid at or near boiling point upwardly from a liquid reservoir to the pump inlet. The tubular casing of the liquid booster device is integrally formed with the case head of the pump and houses at least one booster impeller mounted on a shaft extension of the main pump's shaft.

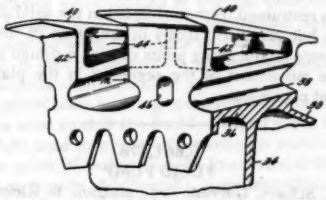
A circular flange is formed at the main pump's inlet for mounting the combined turbine pump — liquid booster

device at the top of the liquid reservoir such that the booster impeller is submerged in the liquid.

3,661,475
TURBOMACHINERY ROTORS

Bernard J. Anderson, Danvers, Mass., and William E. Schoenborn, Cincinnati, Ohio, assignors to General Electric Company

Filed Apr. 30, 1970, Ser. No. 33,220
Int. Cl. F01d *5/32, 5/02*
U.S. Cl. 416—219 **4 Claims**

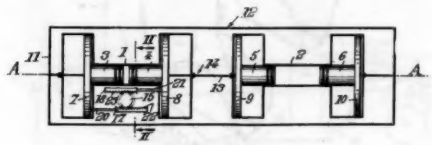


A compressor rotor is disclosed having relatively thin angled platforms connected to the structural portion of a rotor disc by web means.

3,661,476
TANDEM FREE-PISTON MACHINES

Henry Benaroya, 41 Boulevard du Commandant Charcol, Neuilly-sur-Seine, France

Filed Dec. 24, 1969, Ser. No. 887,829
Claims priority, application France, Dec. 30, 1968, 182156
Int. Cl. F04b *17/00, 35/00;* **F02b** *71/00*
U.S. Cl. 417—341 **8 Claims**



A tandem free-piston machine has two movable trains comprising drive and compressor pistons. Synchronizing means are provided between these trains and include an elastic member to absorb at least partly any momentary difference in the forces to which the movable trains are sub-

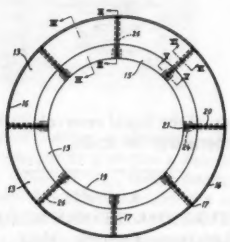
jected. The synchronizing means may be rack and pinion, or lever and connecting rod means. The elastic member may be a torsionally elastic shaft connecting two pinions, or a bendable elastic bar constituting one of said levers.

3,661,477

HEAT SHIELD

Thorbjorn Westrum, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed Dec. 15, 1969, Ser. No. 885,139
Claims priority, application Norway, Dec. 17, 1968, 5037/68
Int. Cl. F01d *25/20;* **F03d** *11/00;* **F06d** *37/02*
U.S. Cl. 417—373 **7 Claims**



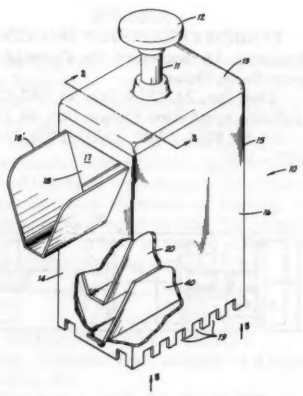
A segmented annular heat shield for mounting between the turbine blade wheel and the compressor impeller of a radial gas turbine. Each segment is fixedly secured to a stationary structure at one point at its outer edge and also fastened to said structure at two further fastening points at its inner edge in such a manner that at these further fastening points the segment is restrained from movement in the axial direction of the shield but can move freely in the plane of the segment. The segments adjoin along joints of such a design as to admit of relative movement of the segments in the plane thereof due to heat expansion.

3,661,478

FLUID PUMP

Robert E. Schurr, Garrett, Ind., assignor to Rieke Corporation, Auburn, Ind.

Filed Apr. 2, 1970, Ser. No. 25,188
Int. Cl. F04b *21/04*
U.S. Cl. 417—555 **3 Claims**



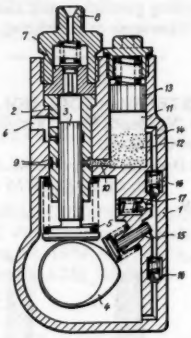
A pump which may be used in debris laden fluid. The pump has a sucker valve attached to the end of a handled rod. The sucker valve and a check valve are enclosed in a main body housing provided with entrance and exit openings. The sucker valve pushes the fluid from the entrance opening to the exit opening.

3,661,479

SEAL FOR RECIPROCATING MACHINE ELEMENTS

Alfred Musketa, Bergisch-Gladbach, Germany, assignor to Klochner-Humboldt-Deutz Aktiengesellschaft, Koln-Deutz, Germany

Filed Nov. 23, 1970, Ser. No. 91,752
Claims priority, application Germany, Dec. 3, 1969, P 19 60 576.6
Int. Cl. F04b *19/22;* **F01m** *1/00;* **F15b** *21/04*
U.S. Cl. 417—437 **6 Claims**



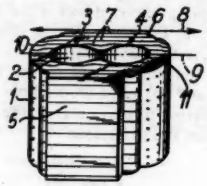
A sealing arrangement for machine elements reciprocable relative to each other and defining with each other a gap to be sealed, in which barrier chamber means extend to said gap and contain a barrier substance intermixed with solid particles having a minimum diameter which is in excess of the width of said gap to be sealed.

3,661,480

HOUSING FOR GEAR PUMPS OR MOTORS

Friedrich Forschner; Hans Kurzhals, both of Waiblingen, and Karl-Heinz Muller, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 30, 1969, Ser. No. 889,280
Claims priority, application Germany, Jan. 16, 1969, P 19 01 964.8
Int. Cl. B23p *15/00;* **B21c** *23/00;* **F01c** *1/18*
U.S. Cl. 418—179 **9 Claims**



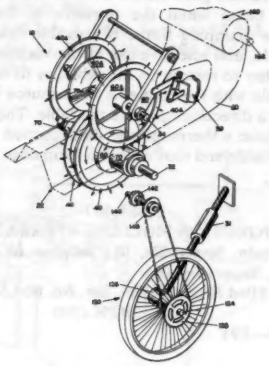
A section of an extrusion profile constitutes a housing especially for use for accomodating a gear pump or motor. The housing has a substantially cylindrical outer contour and a substantially oval cross section and an inner chamber which constitutes at least one longitudinal cylinder having at least one open end and surface lines which extend parallel with the surface lines of the outer contour and perpendicular to the original line threads or flow lines of the extrusion profile section so as to improve the fatigue resistance and especially the tensile fatigue resistance of the housing.

3,661,481

MOBILE THERMOFORMING APPARATUS

James B. Haviland, Jr., and Charles R. Balkema, both Grand Rapids, Mich., assignors to Haviland Agricultural Chemical Company, Grand Rapids, Mich.

Filed Mar. 2, 1970, Ser. No. 15,648
Int. Cl. B29c 17/02
U.S. Cl. 425—62 12 Claims



Thermoforming apparatus and method for continuously thermoforming a continuous web or sheet into a self-supporting, protective crop cover, preferably hat-shaped in cross-sectional configuration. The apparatus utilizes counter-rotating forming means, specifically sets of wheels on two adjacent axles, each set having primary forming wheels fixed to the axle and cooperative idler forming wheels freely rotating thereon, each idler wheel cooperating with a primary wheel on the opposing axle. Heat is supplied to the forming means, preferably by circulation of heated fluid. Forming pressure is supplied by shifting the forming means into cooperative relationship.

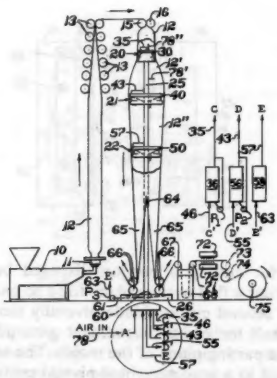
Such a crop cover is continuously formed by simultaneously heating and bending the sheet or web material into the configurated shape, and is continuously positioned over the row as formed, and anchored by pushing dirt onto its flanged edges.

3,661,482

APPARATUS FOR MANUFACTURING BIAXIALLY ORIENTED FILM WITH DIMENSIONAL STABILITY

Stuart L. Brown, Jr., 732 Ashby Drive, Waynesboro, Va.

Filed Aug. 28, 1968, Ser. No. 756,061
Int. Cl. B29c 17/07, 25/00; B29d 23/04
U.S. Cl. 425—66 8 Claims



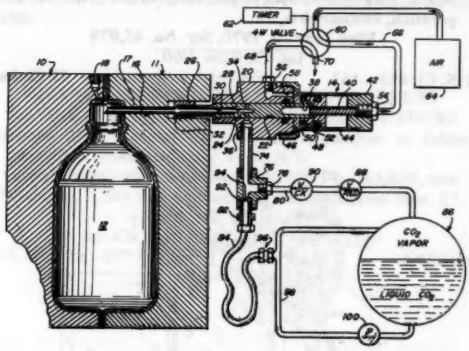
An apparatus is disclosed wherein a plurality of spaced mandrels accurately control expansion and stress relief of thermoplastic tubing in cooperation with means for lubricant assuring uniform operation.

3,661,483

APPARATUS FOR CONTROLLING THE FLOW OF LIQUID

Robert N. Bose, 1015 Naperville Rd., Wheaton, Ill.

Filed Aug. 8, 1969, Ser. No. 848,625
Int. Cl. B29c 5/06
U.S. Cl. 425—72 9 Claims



The intermittent flow of carbon dioxide liquid from a high pressure reservoir to a low pressure use area is controlled by a flow restricting orifice disposed in the supply line and a simple control valve located in the line downstream of the orifice. An additional source of pressurized fluid maintains the pressure between the orifice and the valve above the triple point of carbon dioxide to prevent solidification of the carbon dioxide upstream of the valve.

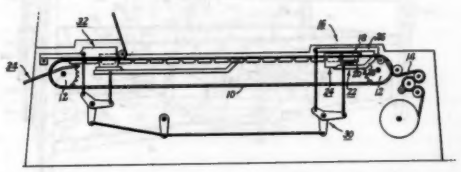
In a cyclical blow molding operation wherein liquid carbon dioxide is used to chill the freshly molded parts, the pressure of the fluid used to expand the parison is maintained above the triple point of carbon dioxide to prevent solidification of the carbon dioxide. Additionally, a predetermined amount of carbon dioxide is permitted to vaporize in the line upstream of the orifice during the off cycle in the molding operation thereby providing the necessary time delay between the application of the parison expanding gas and the injection of the liquid carbon dioxide into the molded part.

3,661,484

AUTOMATIC CONTAINER MAKING APPARATUS

Joseph M. Psota, Hawthorne; Joel A. Hamilton, Englewood, and Russell D. Di Donato, Nutley, all of N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.

Filed Feb. 12, 1970, Ser. No. 10,822
Int. Cl. B29c 17/02
U.S. Cl. 425—109 9 Claims



An automatic packaging machine of the type adapted to form packages from continuous rolls of plastic film. The machine includes an improved heating arrangement to apply heat directly to a plastic film while the film is maintained in its original plane of motion along a defined path prior to for-

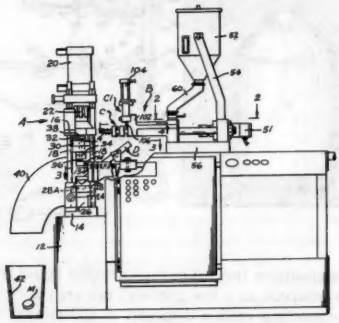
mation into cups. This heating arrangement includes a heated platen positioned for reciprocating contact with one surface of the film. An elastomeric member is synchronized for movement with the heated platen so as to engage the opposite surface of the film and press it into heat transfer contact with the platen. The elastomeric member has a configuration matching the outline of the film area to be heated.

3,661,485

COMPRESSION MOLDING SYSTEM

Vasken F. Arpajian, Huntingdon Valley, and Quentin M. White, Jenkintown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed June 10, 1970, Ser. No. 45,078
Int. Cl. B29c *3/00*
U.S. Cl. 425—162 **12 Claims**



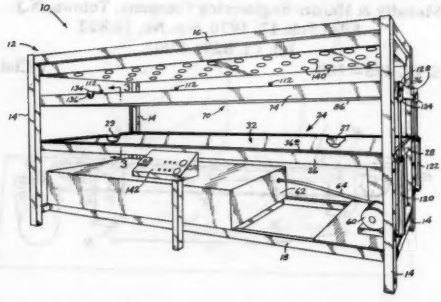
An automatic compression molding system, especially for thermosetting materials, in which an extrusion screw or a number of extrusion screws preplasticize the powder and charge the preplasticized mass into preforms. The preheated and preformed masses are immediately delivered and loaded into the mold cavities to reduce the time of the cure cycle up to 80 percent of that required in cold powder compression molding.

3,661,486

SHEET FORMING APPARATUS

Rodney A. MacDonald, Torrance, Calif., assignor to Merco Products, Inc., Eugene, Oreg.

Filed May 7, 1970, Ser. No. 35,530
Int. Cl. B29c *17/04*
U.S. Cl. 425—174 **9 Claims**



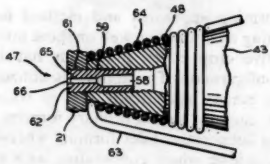
Apparatus for forming sheet material including a mold table, for supporting a mold with a sheet of airproof moldable material draped loosely thereover, and a clamping frame fro clamping the edges of the sheet against the table. The clamping frame includes a hollow side beam with an internally mounted adjustable truss for stiffening the beam to inhibit deflection. A vacuum manifold extends along the side of the beam adjacent the table with suction cups spaced therealong. A lower-than-atmospheric pressure may be produced in the manifold. The suction cups communicate with the manifold and act as vacuum grab means to hold the edges of a sheet against the beam when the pressure in the manifold is lowered. The clamping frame is movable toward and away from the table, and selective use of the vacuum grab permits the sheet either to remain on the table, or to be carried away from the table with the frame. A heat source is spaced from the frame in a direction opposite the table. The heat source is operable to heat a thermoplastic sheet carried with the frame to make it pliable and thus easier to form over the mold.

3,661,487

INJECTION MOLDING APPARATUS

Victor G. Susin, Naperville, Ill., assignor to Young Rubber Company, Naperville, Ill.

Filed Mar. 5, 1969, Ser. No. 804,532
Int. Cl. B29f *1/00*
U.S. Cl. 425—191 **4 Claims**



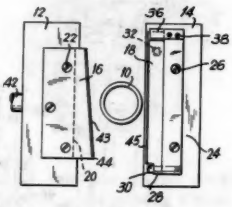
A unique temperature controlled runner system for use in conjunction with transfer and molding apparatus used for elastomers, or the like. The runner system comprises high pressure tubing coupled to extend the pressure injection system to the mold plate cavities. The high pressure tubing is surrounded by heat exchanging means designed to control the temperature within the tubing and the molds.

3,661,488

DEVICE FOR CUTTING PARISONS

Maurice Gaston Latreille, Batavia, Ill., assignor to American Can Company, New York, N.Y.

Filed Apr. 13, 1970, Ser. No. 22,570
Int. Cl. B29d *23/03*
U.S. Cl. 425—196 **10 Claims**



A device for cutting a parison disposed between mold halves comprises a first cutting blade fixed to one of the mold halves and a second cutting blade pivotally mounted on the other mold half for pivotal movement generally in a plane parallel to the parting plane of the molds. The second cutting blade is biased to a predetermined pivotal position, whereby when the mold halves are closed, the first blade engages the

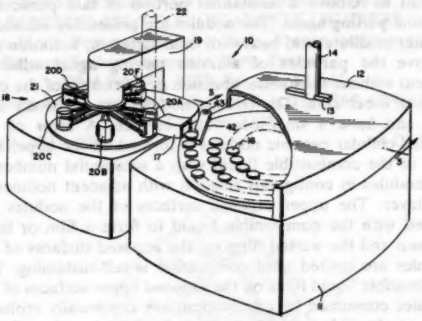
second blade to pivot the latter in opposition to said bias and the said two blades produce a scissoring action operable to cut the parison disposed between the two blades.

3,661,489

APPARATUS FOR FORMING CONTAINERS BY MOLDING

Lawrence A. Moore, King of Prussia, Pa., assignor to Beloit Corporation, Beloit, Wis.

Filed July 7, 1970, Ser. No. 52,812
Int. Cl. B29c *3/00*; B29d *23/03*
U.S. Cl. 425—233 **12 Claims**



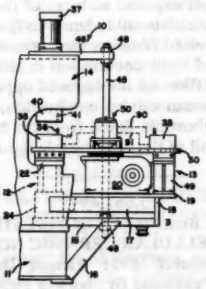
Preforms preferably of a suitable plastic material, are heated and then placed into a container mold where they are formed into containers. The applicable heating oven depends on the shape of the preform when it is heated. A rotary oven with an outwardly spiralling path may be used for flat or partially preshaped preforms. An elongated oven may be used for heating an elongated strip, from which flat preforms are cut after heating. The container mold assembly is constituted by a plurality of individual molds, all rotatable together about an axis of the container mold assembly, the individual molds arriving successively at a loading station for receiving heated preforms.

3,661,490

INJECTION MOLDING MACHINE

Raymond Lee Trueblood, New Carlisle, Ohio, assignor to Trueblood, Inc., Tipp City, Ohio

Filed Jan. 29, 1970, Ser. No. 6,801
Int. Cl. B29c *3/02*
U.S. Cl. 425—243 **4 Claims**



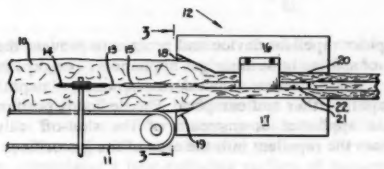
A plastic injection molding machine has a rotary indexing table and means supporting a stationary vertical standard which passes through a bore in the center of the table. A rotary fluid manifold is positioned concentrically about the standard and includes a pair of tubular sleeves having means between them defining axially spaced annular delivery and return passages. The outer sleeve is mounted on the rotary table for rotation therewith and the inner sleeve is keyed to the support standard. The manifold is provided with delivery and return bores in the inner sleeve which communicate with their respective passages and a plurality of outlets from the delivery passage and a plurality of inlets to the return passage to provide for rotary circulation of fluid through a plurality of mold parts spaced about the periphery of the indexing table. The vertical standard adds stability to the rotary table, and the manifold and standard cooperate to permit distribution of fluid to mold parts irrespective of their position on the table.

3,661,491

MEANS FOR PRODUCING FIBROUS PRODUCTS HAVING INTEGRAL TONGUE AND GROOVE EDGES

Richard Lloyd Troyer, Maumee, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.

Original application Sept. 30, 1968, Ser. No. 763,655, now Patent No. 3,549,738. Divided and this application Sept. 17, 1970, Ser. No. 72,989
Int. Cl. B29c *15/00, 3/04*; B29d *27/00*
U.S. Cl. 425—297 **6 Claims**



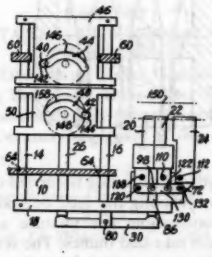
Means for consolidating, shaping and fixing the consolidated density and shape of a body of loose mass of fibers containing binders throughout to produce products of fixed configuration and density, which includes the concerted forming of integral tongue and/or groove longitudinal edges for effective complementary uniting of components with a like adjacent component, and the resulting tongue and/or groove fibrous product.

3,661,492

FLASH REMOVAL APPARATUS

Charles Donald Massa, Elgin, Ill., assignor to American Can Company, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,674
Int. Cl. B29d *23/03*
U.S. Cl. 425—307 **12 Claims**



Apparatus for removing flash material from molded plastic bottles comprises a multi-part die having heated inner die parts insertable into an aperture such as a bottle handle opening and pivoted into a bottle contacting disposition to conform to the contour of the aperture, thereby to soften the

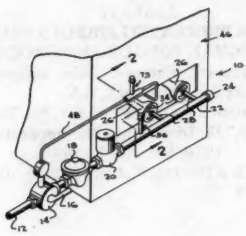
flash and press the latter against the surface of the handle. A heated outer die part is also pivoted with the inner die parts into flash removing relation to the bottle to remove flash at the outside of the handle.

3,661,493

PROCESS AND APPARATUS FOR REPELLING SPIDERS IN GAS APPLIANCES

Monte R. Edwards, Takoma Park, Md., assignor to Washington Gas Light Co., Washington, D.C.

Filed Aug. 3, 1970, Ser. No. 60,571
Int. Cl. F23d
U.S. Cl. 431—4 **20 Claims**



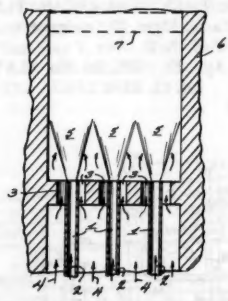
A spider repellent device and process to prevent the infestation of spiders in outdoor gas appliances. The repellents include halobenzenes, haloacetophenones, naphthalene, betanaphthylether and camphor. The device is positioned on the gas appliance downstream of the shut-off valve and dispenses the repellent into the area of the gas orifice.

3,661,494

PROCESS FOR CARRYING OUT ENDOTHERMIC GAS REACTIONS

Fritz Fetting, Darmstadt-Eberstadt; Henning Bockhorn, Darmstadt, and Hans-Adolf Herbertz, Neu-Isenburg, all of Germany, assignors to Deutsche Gold-und Silber-Schneideanstalt vormals Roessler, Frankfurt (Main), Germany

Filed Apr. 27, 1970, Ser. No. 32,008
Int. Cl. F23j *7/00*
U.S. Cl. 431—4 **8 Claims**



Production of hydrogen cyanide is carried out by means of a flame reaction by reacting the feed components in flames produced by a combustible gas mixture and admixing a secondary gas stream into said flames. The secondary gas can flow either parallel to or transversely to the combustible gas. One embodiment of the invention consists in passing ammonia into a hydrocarbon/oxygen-flame front. Another embodiment of the invention consists in passing hydrogen or carbon monoxide into the flame front of a hydrocarbon/ammonia/oxygen-flame.

3,661,495

PROCESS FOR BURNING A COMBUSTIBLE LIQUID USING CELLULAR CERAMIC NODULES

William D. Johnston, Pittsburgh, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed May 19, 1970, Ser. No. 38,866
Int. Cl. F23d *3/18*
U.S. Cl. 431—7 **9 Claims**

A process for the substantially complete combustion of a combustible liquid including the combustion of a layer of the combustible liquid floating on a body of water. Cellular ceramic nodules having a core of separate closed cells and substantially continuous outer surfaces or skins with a coating of particulate alumina parting agent adhering thereto are treated to remove a substantial portion of said particulate alumina parting agent. The nodules are preferably washed in a water or dilute acid bath with mild agitation, to loosen and remove the particles of alumina parting agent adhering thereto without substantial abrasion or fracturing of the continuous outer skin. The treated nodules are relatively dust free and have a smoother outer surface. A layer of the treated cellular ceramic nodules is formed on the upper surface of the combustible liquid with a substantial number of the nodules in contiguous relation with adjacent nodules in the layer. The upper exposed surfaces of the nodules are wetted with the combustible liquid to form a film or layer thereon and the wetted films on the exposed surfaces of the nodules are ignited until combustion is self-sustaining. The combustible liquid films on the exposed upper surfaces of the nodules consumed by combustion, are continually replaced with combustible liquid from the bulk of the liquid until substantially all the combustible liquid is consumed.

3,661,496

PROCESS FOR BURNING A COMBUSTIBLE LIQUID EMPLOYING A PARTICULATE CARBON-COATED CELLULAR CERAMIC NODULE

William D. Johnston, Pittsburgh, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed May 19, 1970, Ser. No. 38,865
Int. Cl. F23d *3/18*
U.S. Cl. 431—7 **8 Claims**

A process for the substantially complete combustion of a combustible liquid including the combustion of a layer of the combustible liquid floating on a body of water. Cellular ceramic nodules are prepared by coating uncellulated pellets with a particulate carbonaceous parting agent and cellulating the coated pellets in a rotary furnace or kiln. The cellular ceramic nodules obtained by the above process have a relatively thin coating of the carbonaceous parting agent thereon and a relatively smooth continuous outer skin. A layer of the coated cellular ceramic nodules is formed on the upper surface of the combustible liquid with a substantial number of the nodules in contiguous relation with adjacent nodules in the layer. The upper exposed surfaces of the coated nodules are wetted with the combustible liquid to form a film or layer thereon and the wetted films on the exposed surfaces of the nodules are ignited until combustion is self-sustaining. The combustible liquid films on the exposed upper surfaces of the coated nodules consumed by combustion, are continually replaced with combustible liquid from the bulk of the liquid until substantially all of the combustible liquid is consumed.

3,661,497

PROCESS FOR BURNING A COMBUSTIBLE LIQUID USING CELLULAR CERAMIC NODULES

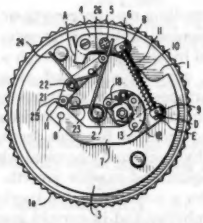
Nicholas T. Castellucci, 6901 Alcama Dr., and Ned C. Krouskop, 611 Pennwood Dr., both of Pittsburgh, Pa.

Filed June 2, 1969, Ser. No. 829,746
Int. Cl. F23d *3/18*
U.S. Cl. 431—7 **14 Claims**

A process for the substantially complete combustion of a layer of combustible liquid floating on a body of water com-

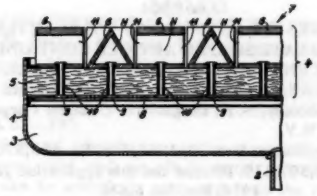
prising spreading a layer of substantially spherical ceramic nodules on the upper free surface of the layer of combustible liquid. The nodules are wetted with the combustible liquid and the combustible liquid is ignited on the upper surface of the nodules until combustion is self-sustaining. The combustible liquid on the upper surface of the nodules consumed by combustion is continually replaced with combustible liquid from the layer until substantially all of the combustible liquid in the layer is consumed. The cellular ceramic nodules have a multiplicity of separate closed cells and the outer surface of the nodules has a plurality of cup shaped recess portions.

3,661,498
SPARK WHEEL ACTUATING MECHANISM PARTICULARLY FOR CIGARETTE LIGHTERS
Andre Pierre Francois Du Pont, Paris, France, assignor to S. T. Dupont (Societe Anonyme), Paris, France
Filed Feb. 24, 1970, Ser. No. 13,642
Claims priority, application France, Feb. 21, 1969, 6904557
Int. Cl. F23q *2/06*
U.S. Cl. 431—275 **4 Claims**



In a spark wheel actuating mechanism of the type that accumulates and suddenly releases energy, in order to render the operation independent of the skill of the user, the said mechanism includes an arming disc turnable by the user; said arming disc compresses a driving spring which exerts a force on a pivotable lever immobilized by a detent and operatively connected to the spark wheel; at the end of its possible angular displacement, the said arming disc causes displacement of said detent. As a result, the said arm is rapidly swung by said spring and thus, a brief, high-speed rotation is imparted to the spark wheel.

3,661,499
RADIATION BURNERS OR GLOW RADIATORS
Kurt Krieger, Oberlinstrasse 16, Dusseldorf, Germany
Filed Jan. 27, 1970, Ser. No. 6,189
Claims priority, application Germany, Feb. 3, 1969, P 19 05 148.0
Int. Cl. F23d *13/12*
U.S. Cl. 431—328 **5 Claims**



A radiation burner or glow radiator, in which a combustible mixture of gas or fuel vapor and air is supplied from a distribution chamber to a permeable burner head, which comprises an insulating layer of heat-resisting and/or fireproof material, for instance a fiber fleece, provided with discrete passage apertures for the combustible mixture, the burner head also comprising a heat-radiating surface of heat-resisting and/or fireproof material, consisting of one or more hollow moulded bodies provided with outlets, in such a way that burning gases issuing from these outlets impinge upon an external surface of an adjacent region of a heat-radiating surface.

CHEMICAL

3,661,500
COMPOSITION FOR DYEING HUMAN HAIR
Joseph W. Dehn, Jr., Great Neck, N.Y., and Mary R. Paradiso, Clifton, N.J., assignors to Shulton, Inc., Clifton, N.J.
Filed July 27, 1970, Ser. No. 64,871
Int. Cl. D06p *3/04*
U.S. Cl. 8—10 **8 Claims**

Composition for dyeing human hair in rich, colorful tones. The dyes consist of a surfactant with a hair coloring agent which may be 6-(2-aminoethylamino)-1,2,3,4-tetrahydronaphtho-[2,3-f]-quinoxaline-7,12-dione; 6-(2-methyl-aminoethylamino)-4-methyl-1,2,3,4-tetrahydronaphtho-[2,3-f]-quinoxaline-7,12-dione; and 6-(2-ethylaminoethylamino)-4-ethyl-1,2,3,4-tetrahydronaphtho-[2,3-f]-quinoxaline-7,12-dione or mixtures of such coloring agents.

3,661,501
CATALYTIC TREATMENT OF SHAPED ARTICLES MADE FROM FIBER-FORMING SYNTHETIC POLYMERS
William Michael Corbett; David Harrison, and Michael Mundie Robertson, all of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Sept. 11, 1967, Ser. No. 666,927
Int. Cl. D06m *7/00, 13/34;* **C08g** *41/04*
U.S. Cl. 8—115.5 **4 Claims**

Procedure for imparting durable antistatic properties to shaped articles made from fiber-forming polyesters or polyamides by modifying the surface thereof. The article is heated while in intimate contact with a polyethylene oxide derivative such as polyethylene glycol diamine and in the presence of an inorganic catalyst such as potassium iodide to effect surface modification thereof.

3,661,502
FLAME-RESISTANT POLYACYLOXALAMIDRAZONE FILAMENTS
Gerhard Meyer, Obernburg; Heinz Grotjahn, Rollfeld; Helmut Magerlein, Erlenbach; Hans-Dieter Rupp, Erlenbach; Michael Wallrabenstein, Erlenbach, and Albert Schopf, Hering, all of Germany, assignors to Glanzstoff AG, Wuppertal, Germany
Filed Apr. 27, 1970, Ser. No. 32,394
Claims priority, application Germany, May 2, 1969, P 19 22 335.9
Int. Cl. D06m *13/50, 11/04*
U.S. Cl. 8—115.5 **16 Claims**

Flame-resistant metal-containing polyacyloxalamidrazone filaments and a process for their production in which the filaments are treated with one or more solvent-soluble compounds of at least one of the metals zinc, tin, cadmium, barium, strontium, calcium, antimony and tantalum for a period of time sufficient to render the filaments resistant to flame.

3,661,503

PROCESS FOR DEHYDRATING CELLULOSIC TEXTILE MATERIAL

Rostislav Dischenko, Middleburg Heights, and Lawrence Prentiss Lowell, Jr., Brookpark, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed May 29, 1969, Ser. No. 829,102
Int. Cl. C01b *31/07*; D06m *1/00*
U.S. Cl. 8—116 P 15 Claims

Flexible carbonaceous textile materials are produced by treating a cellulosic textile material with phosphoric acid, heating the acid-treated material at a temperature between 100° C. and 350° C. in an ammonia-containing atmosphere to produce a non-flammable, non-fusible, strong and flexible permanently dehydrated material, and carbonizing or graphitizing the product so produced to obtain the desired flexible carbonaceous textile material.

3,661,504

BASIC DYEABLE POLYMER OF POLYETHYLENE TEREPHTHALATE SHAPED ARTICLE CONTAINING 0.5 PERCENT OF A SULFONATED PYRROLE

Robert W. Stackman, Morristown, N.J., and Donald E. Sargent, Schenectady, N.Y., assignors to Celanese Corporation, New York, N.Y.

Original application Dec. 29, 1966, Ser. No. 605,570, now Patent No. 3,507,835. Divided and this application Jan. 28, 1970, Ser. No. 6,646
Int. Cl. D06p *5/06*
U.S. Cl. 8—168 5 Claims

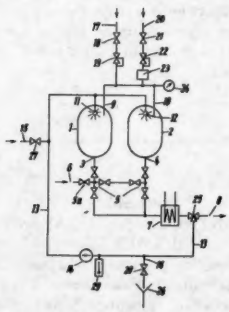
A polyethylene terephthalate shaped article containing a sulfonated pyrrole and permeated uniformly throughout by a cationic dye.

3,661,505

METHOD OF STERILIZING APPARATUS FOR THE HEAT TREATMENT OF LIQUID PRODUCTS

Martin Frolich, Moos-Strasse 2, Gumligen, Switzerland

Filed Apr. 24, 1970, Ser. No. 31,585
Claims priority, application Switzerland, Apr. 28, 1969, 6421/69
Int. Cl. A61l *1/00*
U.S. Cl. 21—56 1 Claim



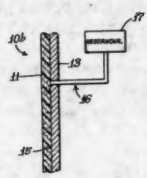
A method of sterilizing apparatus for the heat treatment of liquid products comprises displacing air from the apparatus by steam, circulating hot water through the apparatus so that hot water is sprayed into a vessel and thereby heated by the steam until the steam pressure in the vessel required to reach and maintain the sterilization temperature in the coldest part of the vessel is reached and maintaining this pressure until the sterilization temperature has been maintained for a predetermined sterilization period in the coldest part of the apparatus, subsequently discontinuing the steam supply and cooling the water by a heat exchanger while supplying sterile air which maintains an excess pressure in the apparatus during subsequent discharge of the water. The apparatus is modified to allow this method to be performed.

3,661,506

MEANS AND METHOD OF ELIMINATING AND CONTROLLING MARINE FOULING

Lucius D. Watkins, Hartland, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 3, 1969, Ser. No. 854,979
Int. Cl. A01n *17/00, 23/00*
U.S. Cl. 21—58 7 Claims



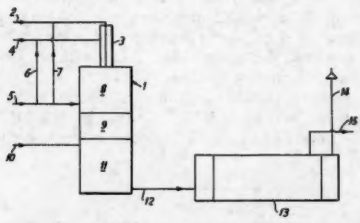
A system for controlling marine growth on submerged surfaces in which chemical anti-foulants are constantly permeated and diffused by absorption through a permeable nonporous membrane, preferably formed as a plastic sheath, having the inner surfaces thereof continuously supplied with the diffusable chemical from a replenishable supply; the plastic sheath being selected for non-destructible and controlled permeation by a selected chemical which is repugnant or toxic to limnological and marine growth. The membrane may be backed up by a non-permeable barrier to isolate permeation to the membrane and in certain instances to form a reservoir system with the membrane. The barrier structure so formed is readily submersible and presents an environmental contacting surface which is highly repellent to marine organisms.

3,661,507

PROCESS FOR DECOMPOSING AMMONIA

Fritz Breitbach, and Gustav Choulat, both of Recklinghausen, Germany, assignors to Firma Carl Still, Recklinghausen, Germany

Continuation-in-part of application Ser. No. 369,187, May 21, 1964, now abandoned. This application Apr. 10, 1969, Ser. No. 824,340
Int. Cl. B01d *53/34*; C01b *2/04*
U.S. Cl. 23—2 R 10 Claims



Process of decomposing the ammonia of impure ammonia-containing vapor clouds, particularly ammonia-containing vapor clouds emanating from coke oven plants and gas works and contaminated by hydrogen sulfide, cyano compounds like HCN, benzene naphthaline and the like. The vapor clouds are first heated to the decomposition temperature of the ammonia, whereafter the hot clouds are passed at this temperature through a decomposition zone to cause decomposition of the ammonia into hydrogen and nitrogen. The

combustible matter in the decomposed gases is then burned in an intermediately installed combustion zone by supplying combustion air. The combustible matter including the hydrogen may be burned at a place remote from the decomposition plant or may be added to other gases.

3,661,508

PROCESS FOR PRODUCING MOLYBDENUM DISULFIDE

Joseph E. Ritsko, Towanda, Pa., assignor to Sylvania Electric Products Inc.

Filed Dec. 14, 1970, Ser. No. 98,069
Int. Cl. C01g *39/00*; C22b *49/00*
U.S. Cl. 23—15 W **8 Claims**

A process for producing molybdenum disulfide from molybdenite ore sources is disclosed wherein the ore is digested in sulfuric acid under controlled conditions for a specific length of time. After digesting, the impure solid molybdenum disulfide is removed and admixed with hydrofluoric acid and hydrochloric acid under controlled conditions for a specific length of time. The solid molybdenum disulfide is then removed and washed.

3,661,509

CATALYTIC PROCESS FOR THE PURIFICATION OF GASES AND CATALYTIC COMPOSITIONS SUITABLE THEREFOR

Italo Ferrara, and Italo Castellani, both of Siracusa, Italy, assignors to Simcat-Societa Industriale Catanese S.p.A., Palermo, Italy

Continuation of application Ser. No. 494,884, Oct. 11, 1965, now abandoned. This application June 20, 1969, Ser. No. 838,028
Claims priority, application Italy, Oct. 20, 1964, 22648/64
Int. Cl. B01d *53/04*, *53/34*
U.S. Cl. 23—2 S **2 Claims**

Gases contaminated with mercury are purified by bringing the same into intimate contact with a catalytic composition comprised of mercuric sulfide and sulfur.

3,661,510

LIGHT BULK DENSITY SODIUM PERBORATE

Donald Charles Winkley, Trenton, N.J., assignor to FMC Corporation, New York, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,979
Int. Cl. C01b *15/12*
U.S. Cl. 23—60 **7 Claims**

A light, bulk density (about 0.3–0.6 g./cc.) sodium perborate having a particle size larger than about 60 mesh is produced by reacting together an aqueous sodium metaborate solution with hydrogen peroxide in the presence of externally prepared, prismatic, seed crystals of sodium perborate tetrahydrate.

3,661,511

PROCESS FOR THE PREPARATION OF PURE ALUMINUM FLUORIDE

Alfred Schmidt, Linz/Donau, Austria, assignor to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz/Donau, Austria

Filed Feb. 11, 1970, Ser. No. 10,625
Claims priority, application Austria, Feb. 25, 1969, A 1864/69
Int. Cl. C01f *7/50*
U.S. Cl. 23—88 **2 Claims**

Preparation of crystalline aluminum fluoride trihydrate low in iron from aqueous soluble iron compounds containing aluminum fluoride solutions by reduction of the ferric ions with nitrogen or sulphur containing reducing agents.

3,661,512

PREPARATION OF CHLORINE AND ALKALI METAL NITRATE AS A SIDE REACTION IN THE PRODUCTION OF NITRIC ACID

Takashi Oushiba, Tokyo, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1969, Ser. No. 819,514
Claims priority, application Japan, Apr. 26, 1968, 43/27696
Int. Cl. C01d *9/04*; C01b *21/44*
U.S. Cl. 23—102 **8 Claims**

A method for producing chlorine and alkali metal nitrate which comprises reacting nitrogen peroxide, water and oxygen in the presence of an aqueous nitric acid containing a nitrate of a group Ia metal having an atomic weight at least as heavy as potassium and reacting a chloride of alkali metal with the resulting solution.

3,661,513

MANUFACTURE OF ALKALI METAL PHOSPHATES

James E. Barker, Freehold, N.J., assignor to Cities Service Company, New York, N.Y.

Filed Aug. 14, 1970, Ser. No. 63,948
Int. Cl. C01b *25/28*, *25/30*, *25/38*
U.S. Cl. 23—107 **10 Claims**

Alkali metal phosphates can be prepared directly from phosphoric acid and an alkali metal salt. Contaminating anions can be selectively extracted from the resulting solution with an immiscible organic amine, such as a secondary aliphatic amine. The alkali metal phosphates can be converted to polyphosphates, such as tripolyphosphate. The alkali metal phosphates and polyphosphates are useful in detergents and fertilizers.

3,661,514

PRODUCTION OF ALKALI-METAL POLYPHOSPHATES BY SPRAY DRYING

John F. Herink, Pocatello, Idaho, assignor to FMC Corporation, New York, N.Y.

Filed July 29, 1970, Ser. No. 59,159
Int. Cl. C01b *25/30*, *25/38*
U.S. Cl. 23—107 **4 Claims**

Alkali-metal phosphates are produced by spraying liquid containing alkali oxide and P_2O_5 values upward into an enclosed drying area against flame or hot gases blowing downward from near the top of the enclosure at a velocity sufficient to force the droplets close to but not past the flame or other source of hot gases and then collecting the product below the level of the spray ports. The product has a higher concentration of granular material than in conventional procedures, greater throughput is obtained and the material is less friable.

3,661,515

METHOD OF BRIGHTENING KAOLIN CLAY BY REMOVING ORGANIC CONTAMINANTS

Joseph Iannicelli; Albert C. Kunkle, and Robert N. Maynard, all of Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of application Ser. No. 654,370, July 19, 1967, now abandoned. This application May 18, 1970, Ser. No. 37,473
Int. Cl. C01b *33/26*; C04b *33/12*; C09c *1/42*
U.S. Cl. 23—110 R **2 Claims**

This invention concerns a method for brightening organically contaminated kaolin by treatment of kaolin slurries with an oxidizing agent followed by sedimentation. The oxidizing agent effects an oxidation of organic matter and the simultaneous liberation of discoloring contaminants which are separated from the beneficiated kaolin by hydraulic classification.

3,661,516

METHOD OF PREPARING AMMONIUM AMIDO-SULFONATE

Heinz-Karl Hofmeister, Kelkheim/Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Mar. 17, 1970, Ser. No. 20,386
Claims priority, application Germany, Mar. 27, 1969, P 19 15 723.4
Int. Cl. C01b *17/00*
U.S. Cl. 23—114 4 Claims

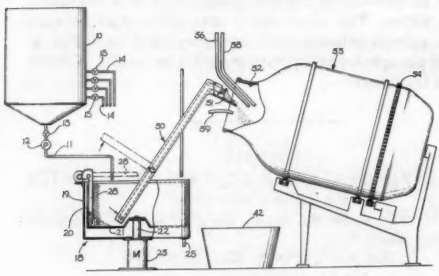
Amido-sulfonic acid and its salts are prepared by direct reaction of sulfuric anhydride with ammonia. The reaction is effected in such a way that a molten reaction product is obtained. By means of this process the reaction heat can be utilized and at the same time high space-time yields are obtained.

3,661,517

METHOD OF MANUFACTURE OF COPPER SULFATE CRYSTALS

Francis R. Bordeaux, 10604 Wheatland Ave., Sunland, Calif.

Filed Nov. 10, 1969, Ser. No. 875,074
Int. Cl. C01g *3/10*; C01b *31/20*
U.S. Cl. 23—125 1 Claim



A source of copper carbonate is obtained, such as by the treatment of a spent alkaline etchant solution with an acid, such as H_2SO_4. The resulting copper carbonate slurry is dried and put into a reactor. The exact amount of water to form $CuSO_4 \cdot 5H_2O$ is added to the reactor and then sulfuric acid is slowly added with agitation until the correct amount of H_2SO_4 is added to make $CuSO_4 \cdot 5H_2O$. The mixture is agitated while cooling and the resulting crystals are small and the yield is almost theoretical with no mother liquor remaining.

3,661,518

PROCESS FOR CONVERTING SULFATES TO SULFIDES

John L. Orahood, Midland, Tex., assignor to Elcor Chemical Corporation, Midland, Tex.

Continuation of application Ser. No. 662,650, Aug. 23, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 14,735
Int. Cl. C01b *17/20*
U.S. Cl. 23—137 5 Claims

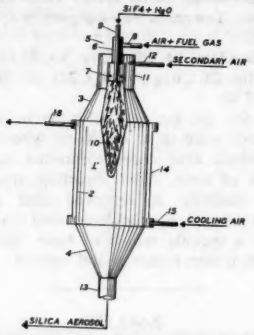
A process is described whereby gypsum is reacted with a reducing gas at temperatures in the order of 1,800° F. to reduce the gypsum to calcium sulfide, and the calcium sulfide thus produced is water quenched with no substantial loss of material and minimum scale formation by quenching under conditions of water temperature and pressure such that no steam is generated.

3,661,519

HYDROLYSIS OF SILICON TETRAFLUORIDE

Richard E. Driscoll, Monroe, La., assignor to Cities Service Company, New York, N.Y.

Filed July 1, 1970, Ser. No. 51,622
Int. Cl. C01b *33/18*, *33/14*
U.S. Cl. 23—182 V 9 Claims



A mixture comprising oxygen, a hydrocarbon fuel and silicon tetrafluoride is burned, the amount of oxygen in the mixture being insufficient for complete combustion of the fuel. A substantial portion of the silicon tetrafluoride is hydrolyzed within the resulting incomplete-combustion hydrocarbon flame, oxygen being added thereafter for combustion of the remaining fuel therein. Probably because of free radical initiation in the incomplete-combustion flame, the conversion efficiency of silicon tetrafluoride to silica can be maintained at high levels while temperatures remain below the fusion-sintering point of the silica, i.e., not in excess of about 1,600° F.

3,661,520

PRODUCTION OF BARIUM HYDROXIDE MONOHYDRATE

Bennie Le Roy Benning, Modesto, Calif., assignor to FMC Corporation, New York, N.Y.

Continuation of application Ser. No. 670,793, Sept. 26, 1967, now abandoned. This application July 13, 1970, Ser. No. 56,192
Int. Cl. C01f *11/02*
U.S. Cl. 23—186 4 Claims

Discrete particles of commercial barium hydroxide monohydrate can be prevented from bonding together into hard, rock-like agglomerates by passing an inert sweep gas over the barium hydroxide monohydrate particles while maintaining them at elevated temperatures in a heating zone to remove substantially all residual water in excess of the stoichiometric amount required to form barium hydroxide monohydrate; the $Ba(OH)_2 \cdot H_20$ assay of the resulting monohydrate product is thereby increased and higher hydrates of barium hydroxide are eliminated.

3,661,521

REFINING OF CUBIC BORON NITRIDE

John D. Birle, Galloway, Ohio, assignor to General Electric Company

Filed Feb. 13, 1970, Ser. No. 11,347
Int. Cl. C01b *21/06*
U.S. Cl. 23—191 7 Claims

Cubic boron nitride is refined from a mixture of cubic boron nitride and hexagonal boron nitride by adding to the mixture lithium hydroxide, sodium hydroxide, or potassium hydroxide, or mixtures thereof and water as may be necessary to control the hydroxide fusion temperature, heating to a low-temperature molten state to dissolve the hexagonal boron nitride, and separating the cubic boron nitride from the remainder of the mixture.

3,661,522

PROCESS FOR PRODUCING PIGMENT GRADE TITANIUM DIOXIDE

Umberto Colombo, Novara, Italy; Bradford C. Hafford, Palmerton, Pa., and Giuseppe Uglietti, Ternate, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy and The New Jersey Zinc Company, New York, N.Y., by said Colombo and said Uglietti, part interest to each

Filed Mar. 31, 1970, Ser. No. 24,347
Claims priority, application Italy, Apr. 2, 1969, 14981 A/69
Int. Cl. C01g *23/04;* C09c *1/36*
U.S. Cl. 23—202 V 5 Claims

Process for producing pigment grade titanium dioxide by heating titanium tetrachloride to a temperature of from about 1,100° to 1,300° C by mixing with combustion gases having a temperature of from about 1,700° to 2,300° C obtained from the combustion of a mixture of carbon monoxide, oxygen and chlorine, the oxygen in the mixture being present in an amount of about 0.5 to 10.0 percent by volume in excess of the stoichiometric amount required for complete combustion of the carbon monoxide, the chlorine comprising from about 1.0 to 10.0 percent by volume of the mixture, and then reacting the thus heated titanium tetrachloride with oxygen at a temperature of from about 1,000° to 1,500° C. Desirably, the titanium tetrachloride is first preheated to a temperature of about 500° C and the oxygen reactant is preheated to a temperature of about 800° C. The titanium dioxide product obtained has a uniform particle size distribution and an average particle diameter greater than 0.25 microns.

3,661,523

PREPARATION OF TITANIUM CARBIDE

Robert S. Sheppard, Doylestown, and William L. Wilson, Barberton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 14, 1970, Ser. No. 28,334
Int. Cl. C01b *31/30*
U.S. Cl. 23—208 A 11 Claims

Titanium carbide, usually in finely divided, particulate form, and often predominantly in the form of small cubic crystals having a particle size range of from about 0.02 to about 1.0 micron and a weight median particle size of from about 0.08 to about 0.8 micron, is formed by reacting titanium halide in vapor state with a reducing agent and carbon source at carbide forming temperatures. Reduction of impurity levels present in the titanium carbide product, e.g., oxygen and halogen, is obtained by collecting the titanium carbide product at temperatures of from about 350° C. to 1,500° C. in the substantial absence of air.

3,661,524

PREPARATION OF TITANIUM CARBIDE

Calvin B. Holden, Doylestown, and William L. Wilson, Barberton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 14, 1970, Ser. No. 28,495
Int. Cl. C01b *31/30*
U.S. Cl. 23—208 A 14 Claims

Titanium carbide, usually in finely divided, particulate form and often predominantly in the form of small cubic crystals having a particle size range of from about 0.02 to about 1.0 micron and a weight median particle size of from about 0.08 to about 0.8 micron, is formed by reacting titanium halide in vapor state with halogenated hydrocarbon, e.g., chlorinated hydrocarbon, and hydrogen at carbide-forming temperatures. Control of the titanium carbide particle size is obtained by conducting the reaction in the presence of a nucleating amount of hydrocarbon, such as methane.

3,661,525

PROCESS FOR NEUTRALIZATION OF AMORPHOUS BORON

Benjamin Y. S. Lee, and John Gonzales, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 25, 1969, Ser. No. 852,923
Int. Cl. C01b *35/00*
U.S. Cl. 23—209 1 Claim

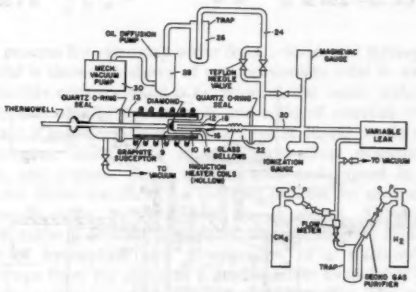
A process for the neutralization of large quantities of amorphous boron with anhydrous ammonia for use in fuel-rich solid propellant formulations wherein boron is used in large amounts.

3,661,526

PROCESS FOR THE CATALYTIC GROWTH OF METASTABLE CRYSTALS FROM THE VAPOR PHASE

John C. Angus, and Nelson C. Gardner, both of Cleveland Heights, Ohio, assignors to Case Western Reserve University

Filed June 24, 1969, Ser. No. 835,929
Int. Cl. C01b *31/06;* B01j *17/20*
U.S. Cl. 23—209.1 11 Claims



There is provided a process for growing metastable crystals, e.g., diamonds, from seed crystals at sub-atmospheric pressures and temperatures in the range of from 800°–1,700° C. The process is characterized by the provision of a catalytic, mobile transfer medium as a layer upon the surface of the seed crystal and exposing the catalytically coated seed crystal to a gas containing the crystallizable material under the foregoing conditions of temperature and pressure.

3,661,527

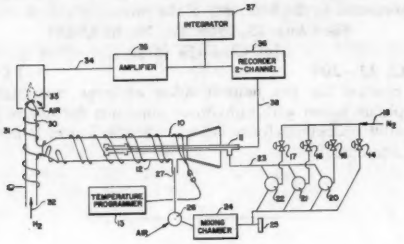
METHOD AND APPARATUS FOR VOLATILITY AND VAPOR PRESSURES MEASUREMENT AND FOR DISTILLATION ANALYSIS

Frank T. Eggertsen, Orinda; Elmer E. Seibert, El Cerrito, and Fred H. Stross, Orinda, all of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,417
Int. Cl. G01n *7/16*
U.S. Cl. 23—230 PC 14 Claims

A microanalyzer for determining volatilities, vapor pressures, and for performing distillation analyses of organic materials wherein a sample of the material is supported in a

removable flow-through probe on a support and heated while flowing carrier gas over the sample to saturate the carrier gas



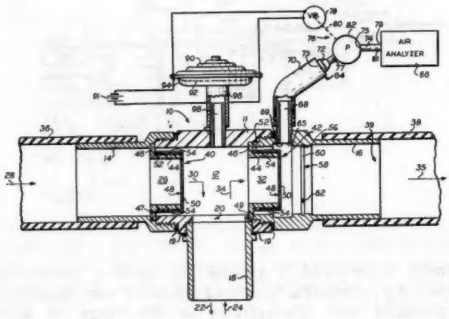
while monitoring the volatiles yields with a flame ionization detector.

3,661,528

BREATH SAMPLER

Donald B. Falk, East Seaford, N.Y., assignor to Instrumentation Associates Inc., New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,176
Int. Cl. G01n *1/22, 33/16*
U.S. Cl. 23—254 R **4 Claims**



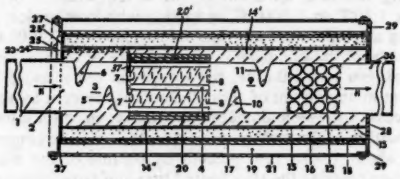
A breath sampler device for use with an air analyzer. The sampler includes a chamber, an intake port leading into the chamber, an outlet port exiting from the chamber, and a breathing port through which a subject inhales from and exhales into the chamber. An intake check valve provides for unidirectional air flow through the intake port into the chamber, and an outlet check valve provides for unidirectional air flow out of the chamber through the outlet port. An air reservoir having a sampling region is associated with the outlet port. Upon exhalation, the outlet check valve opens and the air which has just been exhaled from the subject's lungs is passed from the chamber into the air reservoir where it replaces the residual air contained in the reservoir sampling region from a previous exhalation. In order to discretely sample this expired air before it can be affected by conditions outside the subject's body, a pressure sensing membrane is provided which responds to the decrease in pressure inside the chamber on subsequent inhalation to actuate a switch which closes a circuit to an electric pump which draws a sample of this expired air from the reservoir sampling region into the analyzer.

3,661,529

COMBINATION AFTERBURNER AND AUXILIARY MUFFLER

Charalampos Alexandros Karolidis, 44, Kapodistriou, Athens, 102, Greece

Continuation of application Ser. No. 768,070, Oct. 16, 1968, now abandoned. This application July 6, 1970, Ser. No. 52,660
Claims priority, application Greece, Feb. 26, 1968, 36,751; Sept. 11, 1968, 38,073
Int. Cl. F01n *3/10*
U.S. Cl. 23—277 C **6 Claims**



The device of the present invention may be coupled to a source of exhaust gases and compressed air. The device comprises a tubular casing with a lining of refractory material defining a passage for the mixture of exhaust gases and compressed air. An electrical heating unit and a heat sink unit are mounted in said passage, and baffles are located on the upstream side of the heating unit and intermediate the heating unit and the heat sink unit to deflect the gases from a straight line path to a path in the form of the letter "S," i.e., a reverse curve. The heater is provided with a body of refractory material affording a restricted passage section for the mixture of gases. The electrical resistance heating elements of the heater are disposed in said restricted passage.

3,661,530

PREPARATION OF FREE-FLOWING SULFUR COMPOSITION

Michael J. Block, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 28, 1970, Ser. No. 32,747
Int. Cl. C01b *17/10*
U.S. Cl. 23—224 **6 Claims**

Preparation of a free-flowing sulfur composition consisting essentially of particulate rhombic sulfur and a hydrocarbon having from about 6 to 50 carbon atoms in an amount sufficient to prevent caking of the sulfur is described herein.

3,661,531

PROCESS FOR ASSAY OF 2-HALOETHYLPHOSPHONIC ACID

Clarence Richard Stahl, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,500
Int. Cl. G01n *31/16*
U.S. Cl. 23—230 R **10 Claims**

A process for the assay of 2-haloethylphosphonic acid, containing such impurites as esters thereof, 2-hydroxyethylphosphonic acid, vinylphosphonic acid, and/or phosphoric acid, is described. The process comprises:

1. neutralizing an aqueous solution of a sample of 2-haloethylphosphonic acid to a pH in the range of about 8.5–9.6, preferably about 9.3.
2. boiling the neutralized solution for about one-half hour,
3. titrating the thus obtained solution with an alkali to a pH in the range of about 8.5–9.6 preferably about 9.3.

A preferred indicator, for the neutralization (1) and the titration (3), is Thymol Blue indicator, and a preferred alkali for said neutralization and titration is sodium hydroxide. The percent of 2-haloethylphosphonic acid in the sample can be computed from the amount of alkali consumed in the titration.

3,661,532
PROCESS AND AGENT FOR THE DETECTION OF SILVER IONS

Dieter Schmitt; Alfred Stein, and Wilhelm Baumer, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

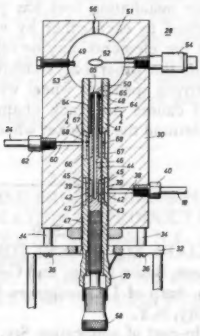
Filed Dec. 9, 1970, Ser. No. 96,665
Claims priority, application Germany, Aug. 4, 1970, P 20 38 651.0
Int. Cl. C09k *3/00; G01n 33/00*
U.S. Cl. 23—253 TP **13 Claims**

An indicator for the colorimetric detection of silver ions is formed by impregnating an absorbent carrier with an intimate mixture of cadmium sulfide and selenium.

3,661,533
ADJUSTABLE APPARATUS FOR FLAME IONIZATION AND FLAME EMISSION DETECTION

Donald J. David, and David L. Zipps, both of Austin, Tex., assignors to Tracor, Inc., Austin, Tex.

Filed Sept. 22, 1969, Ser. No. 859,912
Int. Cl. G01n *31/12*
U.S. Cl. 23—254 R **19 Claims**

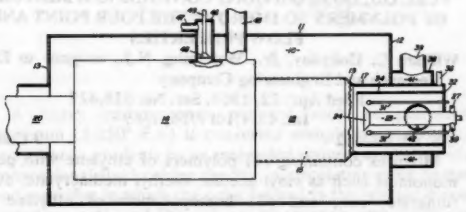


A flame detector for analyzing constituents of a gas sample includes means for selecting the distance between the flame and an ion collector and means for selectively optically shielding the flame from a photometric device for optimizing sensitivity and specificity in flame ionization and flame emission detection.

3,661,534
APPARATUS FOR SULFUR RECOVERY

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed June 15, 1970, Ser. No. 45,968
Int. Cl. C01b *17/04*
U.S. Cl. 23—262 **3 Claims**

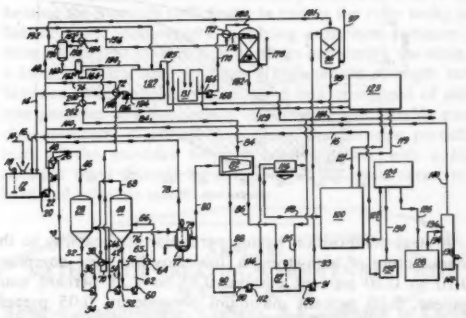


Apparatus is provided for burning sulfur which combines a jacketed pipe and a nozzle for spraying sulfur at a controlled temperature in a first chamber, a second chamber where the sulfur is burned downstream from the nozzle and a third chamber where the combustion product is mixed with acid gas to provide a mixture of gases suitable for transfer to a Claus reactor.

3,661,535
PROCESS FOR DRYING HYDROPHILIC ORES AND RECOVERING SULFUR THEREFROM

Robert L. Somerville, Neshanic, N.J., assignor to Singmaster & Breyer, New York, N.Y.

Filed Sept. 13, 1968, Ser. No. 759,656
Int. Cl. B01d *1/00, 3/36, 11/02*
U.S. Cl. 23—306 **1 Claim**



A process for removing water from a water-wet hydrophilic solid is shown. A slurry of wet, particulate solid in water-immiscible organic liquid is evaporated; the vapor including water and organic is removed; and solid of reduced water contact is separated from residual organic liquid. Preferably, evaporation takes place in a multiple-effect evaporation zone, and organic liquid is recovered and reused in the process. More specifically, a leaching process for recovering elemental sulfur in hydrophilic ore is shown. Xylene, in which sulfur is soluble, is used to slurry a flotation concentrate of hydrophilic ore. Evaporation of a water-xylene azeotrope from the slurry in a double effect evaporator permits the xylene to contact and dissolve the sulfur. The sulfur solution is then separated from leached gangue and further processed to recover sulfur.

3,661,536
TUNGSTEN MATERIALS

Shogo Shimizu, Chigasaki-shi; Takami Motose, Atsugi-shi; Syu Yamazaki, Tokyo; Michiyasu Komatsu, and Hiroshi Yamamoto, both of Yokohama-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of application Ser. No. 596,227, Nov. 22, 1966, now abandoned. This application Sept. 10, 1969, Ser. No. 856,572
Claims priority, application Japan, Mar. 11, 1966, 41/14638; Mar. 14, 1966, 41/15708
Int. Cl. B22f *3/12*
U.S. Cl. 29—182 **6 Claims**

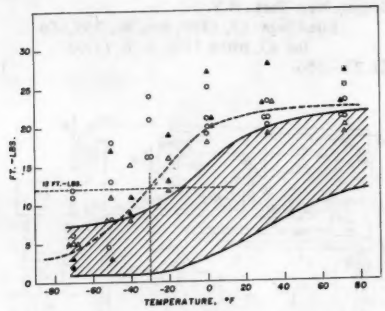
Tungsten materials prepared by adding during the manufacture of powdered tungsten 0.01 to 2.0 percent by weight of aluminum oxide (Al_2O_3), silicon dioxide (SiO_2) or potassium monoxide (K_2O) singly or in combination on the basis of the tungsten, and 0.005 to 0.5 percent by weight of cobalt (Co) or tin (Sn) singly or in combination on the basis of the tungsten in such a manner that after mixture is sintered into a plate or wire, the final composition thereof comprises 0.0001 to 0.05 percent by weight of aluminum (Al), silicon (Si) or potassium (K) singly or in combination and 0.002 to 0.5 percent by weight of cobalt (Co) and/or 0 to 0.0005 percent by weight of tin (Sn) and tungsten and minute amounts of impurities as the remainder.

3,661,537

WELDED PIPE STRUCTURE OF HIGH STRENGTH LOW ALLOY STEELS

Arthur H. Aronson, Pittsburgh; Edward J. Lichy, Gibsonia; Clifford A. Guess, Coraopolis, and Norman L. Samways, Pittsburgh, all of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed July 16, 1969, Ser. No. 842,285
Int. Cl. B21d *39/02*
U.S. Cl. 29—191 4 Claims



A steel composition having particular applicability to the manufacture of high-strength, low-alloy line pipe comprises 0.10 to 0.20 percent carbon, 0.85 to 1.25 percent manganese, 0.10 percent maximum phosphorus, 0.05 percent maximum sulfur, silicon in an amount not adversely affecting steel properties, 0.02 to 0.05 percent columbium, 0.10 percent maximum vanadium, an inclusion shape-control agent selected from the group consisting of zirconium, a rare earth or mischmetal, the balance iron.

3,661,538

PLASTICS MATERIALS HAVING ELECTRODEPOSITED METAL COATINGS

Peter Thomas Brown, Westley Waterless, near Newmarket Suffolk, and John Rowland Phillips, Royston, both of England, assignors to Ciba Limited, Basel, Switzerland

Filed May 21, 1969, Ser. No. 826,709
Claims priority, application Great Britain, May 27, 1968, 25,253/68
Int. Cl. C23b *5/60*; C23f *17/00*; B44d *1/092*
U.S. Cl. 29—195 21 Claims

It is known to coat plastics materials, especially thermoplastics such as ABS, with metal by electrodeposition, typically with chromium on top of nickel. Conventional methods are often unsatisfactory when applied to thermosetting resin-based articles, the metal coating peeling or flaking off when the articles are subjected to repeated changes in temperature. It has now been found that copper or nickel coatings adhere well to surfaces, prepared in a conventional manner, of thermosetting plastics as well as of thermoplasts, provided that the coatings are electrodeposited in a manner such that they have an average stress in tension of at least 2,000 kg./sq. cm.

E.g., a molding prepared from "Araldite" MY 750, HT 972, calcined china clay and glass fibers, is prepared for electroplating by

a. etching with chromic acid
b. depositing a film of palladium through treatment with stannous chloride and palladium chloride solutions
c. depositing a film of copper or nickel by reduction of copper sulphate or nickel sulphate solutions.

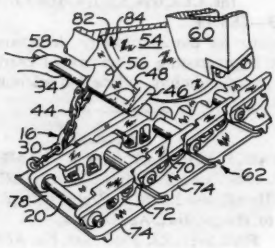
Next, a nickel coating is electrodeposited under conditions such that it had an average stress in tension of 2,440 to 6,460 kg./sq. cm.: this coating being dull, a bright, lightly stressed nickel coating was electrodeposited before the final layer, of chromium, was applied.

3,661,539

TRACK CHAIN INSTALLATION TOOL

Richard D. Eastman, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1970, Ser. No. 26,853
Int. Cl. B25b *27/22*
U.S. Cl. 29—270 17 Claims



A track chain installation tool has two bar elements adjustably connected to each other by a flexible member so that one of the bar elements may be releasably secured to a track chain and the other bar element may be releasably secured to a driven sprocket wheel whereby driving of the sprocket wheel causes the track chain to properly engage with and wrap around the sprocket wheel.

3,661,540

AUXILIARY EQUIPMENT FOR BLENDING

Warren E. Green, Baton Rouge, and George H. Perry, Greenwell Springs, both of La., assignors to Ethyl Corporation, New York City, N.Y.

Continuation-in-part of application Ser. No. 614,469, Feb. 7, 1967, now abandoned. This application Mar. 16, 1970, Ser. No. 19,971
Int. Cl. C10l *1/04*
U.S. Cl. 44—2 10 Claims

Apparatus for monitoring and controlling blending as in gasoline manufacture, with computing and display units to show Research and Motor Octane Numbers, Road Index, and accumulated octane barrels by which blended stream departs from target. Signals from test engine give octane deviation which are added to adjustable reference signal to give Octane Numbers. Octane deviation signals are also multiplied by stream flow rate signals and integrated to give accumulated net that can be shown on properly sensed digital display.

3,661,541

FUEL OIL COMPOSITIONS CONTAINING A MIXTURE OF POLYMERS TO IMPROVE THE POUR POINT AND FLOW PROPERTIES

William C. Hollyday, Jr., Watchung, N.J., assignor to Esso Research and Engineering Company

Filed Apr. 22, 1969, Ser. No. 818,427
Int. Cl. C10l *1/16*, *1/18*
U.S. Cl. 44—62 9 Claims

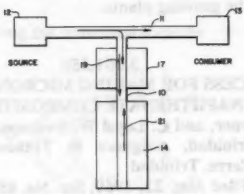
Mixtures containing (1) polymers of ethylene with polar monomers such as vinyl acetate, methyl methacrylate, ethyl fumarate, etc., and (2) homopolymers of ethylene or copolymers of ethylene with $C_3 - C_{18}$ alpha-olefins synergistically improve the pour point and flow characteristics of middle distillate petroleum oils.

3,661,542

SHORT TERM PEAK SHAVING OF NATURAL GAS

Michael H. Collins, Frodsham, England, assignor to Shell Oil Company, New York, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,744
Claims priority, application Great Britain, Jan. 23, 1969, 3,955/69
Int. Cl. F17d 1/04
U.S. Cl. 48—191 17 Claims



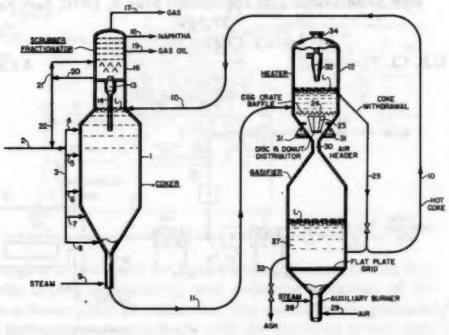
Apparatus and method for "peak shaving" storage of gas in a gas distribution system wherein the pressure varies from a maximum when demand is low to a minimum when demand is high, the method comprising cooling gas, in a gas storage chamber in open fluid communication with the system with a frozen cooling medium having a freezing point approximately midway between the minimum and maximum boiling points of the gas in the system. When the pressure in the system is high, gas in the chamber liquifies and is stored; when the pressure in the system is low gas in the chamber vaporizes and is available for use.

3,661,543

FLUID COKING PROCESS INCORPORATING GASIFICATION OF PRODUCT ORE

Arthur L. Saxton, Warren Township, N.J., assignor to Esso Research and Engineering Company

Filed Nov. 26, 1969, Ser. No. 880,219
Int. Cl. C10j 3/00; C10b 49/10
U.S. Cl. 48—206 10 Claims



A heavy carbonaceous material such as petroleum residuum (1,050° F.+) is converted completely to distillate and gaseous products by an integrated process consisting of a conventional fluid coking reactor, a circulating coke heater, and a gasifier in which the coke formed in the reactor is converted to an H_2 and CO rich gas by reaction with steam and an oxygen-containing gas. The process can also be operated by yield a net product of good quality coke.

3,661,544

A METHOD FOR MAKING THERMOSETTING RESINOUS ABRASIVE TOOLS

Noble D. Whitaker, Los Alamitos, Calif., assignor to BMI Laboratories, Industry, Calif.

Filed Nov. 28, 1969, Ser. No. 880,949
Int. Cl. B24b 17/00; C08g 51/12
U.S. Cl. 51—295 12 Claims

A method for producing an abrasive tool or structure which includes the steps of mixing an abrasive composition containing abrasive particles and, preferably, friable particles, with a liquid, multi-stage, thermosetting resin and coating substantially all of the individual particles with the resin; curing the resin to the B-stage while the resin is in contact with the particles to form a fusible solid coating on the particles and forming individual particles coated with said B-stage resin, and placing said resin coated particles in a mold and heating the particles sufficiently to render the resin tacky and fusible and, concurrently, applying sufficient pressure to form a coherent mass of said particles and curing the resin to a hard infusible state to form a high tensile strength bond between said particles. An abrasive tool composed of abrasive particles and lightweight, easily crushable, friable particles uniformly dispersed throughout the abrasive particles, each of the particles being bonded together with a high strength bond formed by a thermosetting resin cured to a hard and infusible state.

3,661,545

METHOD FOR TREATING A MOLTEN SALT WITH WATER VAPOR

Roger F. Bartholomew, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 19, 1969, Ser. No. 878,225
Int. Cl. C03c 15/00; C03b 18/00
U.S. Cl. 65—30 5 Claims

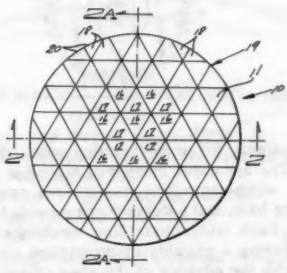
This invention relates to the strengthening of alkali metal silicate glass articles through an ion exchange reaction employing a bath of molten alkali metal salt as the source of exchanging ions. More specifically, this invention relates to a means for typing up calcium ions present in the bath of molten salt, which deleteriously affect the strengthening capability of the bath, by passing water vapor through the molten salt.

3,661,546

MIRROR BLANK CORE AND METHOD OF MAKING

Robert A. Busdiecker, Woodville; James E. Rapp, Oregon, and Clarence L. Babcock, Toledo, all of Ohio, assignors to Owens-Illinois, Inc.

Continuation of application Ser. No. 518,446, Jan. 3, 1966, now abandoned. This application May 21, 1970, Ser. No. 39,520
Int. Cl. C03b 29/00, 11/08; G02b 5/08
U.S. Cl. 65—33 14 Claims



Unitary, rigid telescope mirror blanks are disclosed formed from a plurality of polyhedrons. The polyhedrons may be

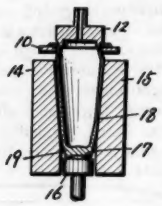
glass or crystallized glass and are assembled so that adjacent facing complimentary and parallel contacting surfaces are directly sealed to each other and none of the contacting surfaces are perpendicular to the horizontal when the mirror blank is in a substantially horizontal position. Methods of sealing and crystallizing are disclosed.

3,661,547

METHOD FOR MOLDING HOLLOW AND BOTTOMED GLASS ARTICLES

Toshio Nakayama, Otu-shi, Japan, assignor to Nippon Electric Glass Company Limited

Filed May 19, 1969, Ser. No. 825,780
Int. Cl. C03b 9/04
U.S. Cl. 65—67 **1 Claim**



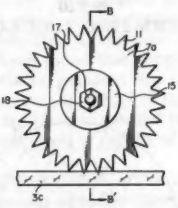
In mold-blowing a parison, which is glass in a still soft state, in a blow mold composed of two drum sections and one bottom section, the surface of the bottom section receiving the parison bottom is given in advance the same shape as that of the finished product and upon completion of molding by mold blowing, the bottom section is raised a predetermined distance, thereby effecting the final mold finishing so that the glass article may have the same shape and size as the finished product. Other advantages and details will be made clear.

3,661,548

APPARATUS FOR MANUFACTURING GLASS RIBBON BY FLOAT PROCESS

Kunihiko Ito; Yokiya Fujimoto; Nobuyoshi Ohsato, and Naotomo Akashi, all of Maizuru, Japan, assignors to Nippon Sheet Glass Co., Ltd., Higashi-ku, Osaka, Japan

Filed June 26, 1970, Ser. No. 50,143
Claims priority, application Japan, June 30, 1969, 44/52059; 44/52060; Aug. 25, 1969, 44/68233
Int. Cl. C03b 18/00
U.S. Cl. 65—182 R **11 Claims**



An apparatus for manufacturing glass ribbon by float process. The apparatus comprises a molten metal bath, at least two width-controlling mechanisms provided on both sides of the bath, and a delivery roll provided on exit side of the bath. Each width-controlling mechanism has a rotary member having a plurality of projections capable of freely rotating with the advance of the glass ribbon. And an angle of less than 45° is formed by the plain containing the rotary member with respect to the direction of advance of the glass ribbon.

3,661,549

USE OF ETHYLENE FOR INCREASING CROP YIELDS

Arthur H. Freytag, Gurnee, and Emil P. Lira, Des Plaines, both of Ill., assignors to International Minerals & Chemical Corporation

Filed Apr. 30, 1969, Ser. No. 820,651
Int. Cl. A01n 9/40; C05f 11/00
U.S. Cl. 71—1 **12 Claims**

Yields of crops such as soybeans and corn are increased by introducing an effective amount of ethylene into the soil near the roots of the growing plants.

3,661,550

PROCESS FOR MAKING MICRONUTRIENT NAPHTHENATE COMPOSITIONS

John D. Downer, and C. Loyal W. Swanson, both of Pointe-a-Pierre, Trinidad, assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad

Filed Aug. 22, 1969, Ser. No. 852,470
Int. Cl. C05f 11/00
U.S. Cl. 71—27 **3 Claims**

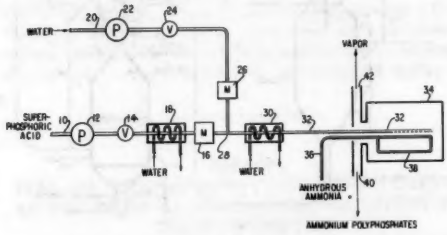
A micronutrient composition intended for application to the foliage, branches or barks of plants is described as containing oil soluble calcium, copper, molybdenum, magnesium, zinc. manganese or iron naphthenates of higher molecular weight in a horticultural spray oil. The naphthenic acids composition is made by mixing a solution of naphthenic acids in a light aromatic solvent with an aqueous sodium hydroxide solution to form sodium naphthenate, then adding an additional amount of solvent; heating and reacting with an aqueous solution of a water soluble salt of one of the above mentioned metals; separating the organic layer from the aqueous layer; washing the organic layer with water and then adding to the organic layer the quantity of spray oil required to obtain a composition having the desired concentration and removing substantially all of the light aromatic solvent so that the spray oil remains non-phytotoxic.

3,661,551

PROCESS FOR PRODUCING HIGH ANALYSIS AMMONIUM POLYPHOSPHATES

Ernest C. Camp, Jr., College Park, Ga., and Herbert J. Clausen, Apollo Beach, Fla., assignors to Cities Service Company, New York, N.Y.

Continuation of application Ser. No. 634,191, Apr. 27, 1967, now abandoned. This application May 4, 1970, Ser. No. 37,359
Int. Cl. C05b 13/06, 1/06
U.S. Cl. 71—34 **4 Claims**



A method of preparing solid ammonium polyphosphate fertilizers from superphosphoric acid containing non-orthophosphates by diluting the superphosphoric acid at a temperature and rate to inhibit the hydrolysis of the polyphosphates to orthophosphates, and then promptly ammoniating the diluted superphosphoric acid in a reactor at a controlled rate, while maintaining the reactor bed temperature at below 185° F., so that the exothermic heat of neutralization is removed by the heat required for the evaporation of the water and obtaining a solid product.

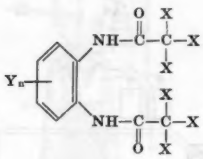
3,661,552

PROCESS FOR THE CONTROL OF PLANT GROWTH WITH SUBSTITUTED N,N'-BIS(HALOACETYL)-O-PHENYLENE DIAMINES

Edmund J. Rumanowski, Dover, N.J., assignor to Tenneco Chemicals, Inc.

Original application Oct. 25, 1967, Ser. No. 677,853, now Patent No. 3,557,221. Divided and this application Sept. 23, 1970, Ser. No. 74,935
Int. Cl. A01n 9/20
U.S. Cl. 71—118 10 Claims

Compounds having the structural formula



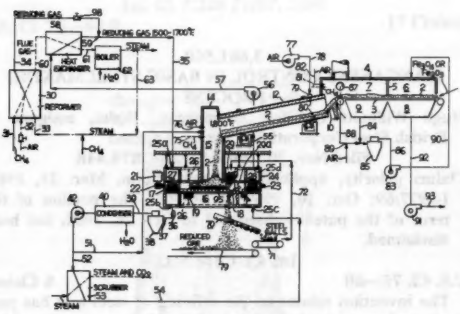
wherein each X represents hydrogen, chlorine, or fluorine and each Y represents halogen, lower alkyl, lower alkoxy, cyano, trifluoromethyl, or nitro, and *n* represents an integer in the range of zero to four; are useful as preemergence and postemergence selective herbicides. Illustrative of these compounds are N,N'-bis(trichloroacetyl)-4,5-dichloro-o-phenylene diamine, N,N'-bis(chloroacetyl)-4,5-dichloro-o-phenylene diamine, and N,N'-bis(trifluoroacetyl)-3,4,5-tribromo-o-phenylene diamine.

3,661,553

PROCESS FOR REDUCING OXYGEN CONTENT OF OXIDIC MINERAL ORE

Robert D. Frans, Middleburg Heights, Ohio, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 1, 1968, Ser. No. 772,753
Int. Cl. C22b 1/102, 5/12, 9/00
U.S. Cl. 75—3 9 Claims



A process is disclosed for heat-treating mineral ore by successively drying, preheating, and reducing particles of the ores to a lower state of oxidation. The particles are gathered into a first gas permeable body with the particles at rest relative to each other within the body and dried and preheated until hardened. The body is then disrupted and a tumbling movement is imparted to the particles while further heating with heated reducing gases to initiate at least preliminary reduction. The particles are regathered into a second gas permeable body with the particles at rest relative to each other within the body and fuel that has been reformed into a stream of reducing gases rich in hydrogen and/or carbon monoxide is passed through the second body of particles to further reduce the particles. The reducing gases that have passed through the second body of particles are divided into two branch streams with a first of the branch streams being delivered to and directed through the particles being tumbled to effect a preliminary reduction, after which this gas stream is made oxidizing and passed through the first body of particles to effectuate the preheating and drying thereof. The other branch stream of gases is first mixed with a fresh supply of the hydrogen and/or carbon monoxide rich gases and thereafter recycled through the second body of particles.

3,661,554

PROCESS FOR HARDENING AGGLOMERATED BODIES OF ORE CONCENTRATE IN A HIGH FREQUENCY ALTERNATING FIELD

Endel Wijard, Sodertalje, and Jan Odsvall, Tyreso, both of Sweden, assignors to Aktiebolaget Elektrodius, Stockholm, Sweden

Filed Apr. 7, 1969, Ser. No. 814,191
Claims priority, application Sweden, Apr. 11, 1968, 4992
Int. Cl. C21b 1/20
U.S. Cl. 75—3 8 Claims

When agglomerating ore concentrates the green agglomerated bodies lack strength and hardness to be handled and charged into the reducing furnaces. The process according to the present invention resides in the hardening of the green agglomerated bodies by exposing them to a high frequency alternating field and in a further hardening treatment by exposing the bodies so treated to a hydrothermal treatment at a high temperature and at a corresponding high pressure.

3,661,555

PELLETIZED CHROMIUM ADDITION AGENTS FOR FERRO ALLOYS PRODUCTION AND METHOD THEREFOR

Fumihiko Kusama, and Minoru Yamanaka, both of Saitama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed June 24, 1969, Ser. No. 836,156
Int. Cl. C22b 1/14, 39/00
U.S. Cl. 75—3 5 Claims

Chromium addition agents which may be advantageously applied in production of chromium-containing alloys can be produced by roasting at 2,350°–2,750° F. a previously pelletized mixture of Cr ore, a binder, carbon and if desired a flux. The pellets produced are hard, internally porous and have a film on the surface thereof consisting of various metal oxides. Mainly carbides of Cr and Fe are found in the inner region of the pellet.

3,661,556

METHOD OF MAKING FERROMAGNETIC METAL POWDERS

John Eric Jolley, and Ernest Lewis Little, Jr., both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 3, 1969, Ser. No. 803,985
Int. Cl. C22b 23/04, 39/00
U.S. Cl. 75—0.5 AA 6 Claims

The magnetic properties of ferromagnetic metal powders made by the borohydride reduction of appropriate mixtures of iron, cobalt, nickel and optionally chromium salts can be modified by the addition of complex forming agents to the reaction medium.

3,661,557

PROCESS FOR THE PRODUCTION OF METAL POWDER

Elis Kjell Ake Svanstrom, Nynashamn, Sweden, assignor to Rederiaktrebolaget Nordstjernan

Filed Aug. 20, 1969, Ser. No. 851,746
Claims priority, application Sweden, Aug. 23, 1968, 11368/68
Int. Cl. B22f 9/00; C22b 5/12, 57/00
U.S. Cl. 75—0.5 BB 9 Claims

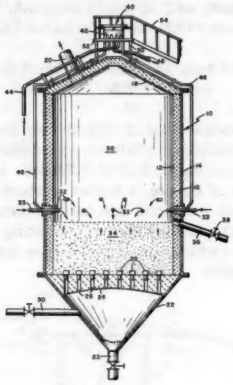
The invention relates to a process for affecting grain growth in the production of metal powder from the metals W, Mo, Ta, Nb or Re or from alloys comprising one or several of these metals, by reduction in a gas phase of the metal halides by means of hydrogen gas. The reduction may be carried out in one or several steps so that partially or completely reduced metal powder is obtained. If there is partially reduced metal powder, this powder is exposed to at least one additional treatment consisting of the mechanical decomposition of the powder and/or heat treatment at a temperature of 400°–1,200° C., preferably 700°–1,100° C. in an atmosphere containing some form of halogen. If there is a completely reduced metal powder, this powder is exposed to at least one additional treatment consisting of either a heat treatment at a temperature of 400°–1,200° C., preferably 700°–1,100° C. in an atmosphere containing some form of halogen or the mechanical decomposition of the powder followed by said heat treatment.

3,661,558

PROCESS AND APPARATUS FOR DISTRIBUTING SLURRY TO A REACTION FURNANCE

Thomas D. Heath, and Walfred W. Jukkola, both of Westport, Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Feb. 16, 1970, Ser. No. 11,508
Int. Cl. C22b 1/10; F27b 15/08
U.S. Cl. 75—9 20 Claims



A feed distribution system for feeding slurry to a fluidized bed reactor through a plurality of feed guns placed around the periphery of the reactor. The feed distribution system includes a feed distribution tank and having no mechanically moving parts located above the reactor. The tank is divided by baffles into essentially two concentric zones, namely an inner zone which serves as a feed reservoir and an outer zone which is further subdivided into individual compartments and serves to feed slurry at a steady rate to said feed guns.

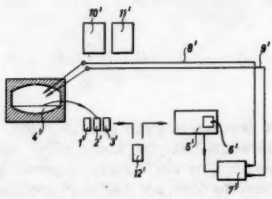
Also disclosed is a process utilizing said feed distribution system.

3,661,559

METALLURGICAL PROCESS CONTROL OF OXYGEN CONTENT

Aurel Horvath; Gellert Repasi, both of Dunaujvaros; Elek Szabo, and Bruno Vorsatz, both of Budapest, all of Hungary, assignors to M.T.A. Kozponti Fizikai Kutato Intezet, Konkoly thegeout, Budapest and Dunai Vasmu, Dunaujvaros, Hungary, part interest to each

Filed Dec. 3, 1968, Ser. No. 780,855
Claims priority, application Hungary, Dec. 6, 1967, MA1788
Int. Cl. C21c 7/06; G01t 1/20
U.S. Cl. 75—45 2 Claims



A metallurgical process is controlled by directly measuring the oxygen content of a specimen taken from the melted charge. The specimen is subjected to neutron radiation, and the radiation of the resulting ^{16}N isotopes is measured. Addition agents are then used to alter the oxygen content of the charge to a desired value. Preferably, the specimen is bombarded simultaneously with a specimen of known oxygen content, and the differences in radiation of the known and unknown specimens are automatically displayed and/or used to effect the desired additions.

3,661,560

MANGANESE CONTROL IN BASIC STEELMAKING PROCESS

Hugh Willmott Grenfell, Glamorgan, Wales, assignor to British Steel Corporation, London, England

Filed Nov. 20, 1969, Ser. No. 878,448
Claims priority, application Great Britain, Mar. 21, 1969, 14,977/69; Oct. 10, 1969, 49,907/69. The portion of the term of the patent subsequent to Oct. 26, 1988, has been disclaimed.
Int. Cl. C21c 5/32
U.S. Cl. 75—60 6 Claims

The invention relates to the refining of steel and has particular reference to the refining of steel by a process in which a stream of hot gases is directed onto the upper surface thereof.

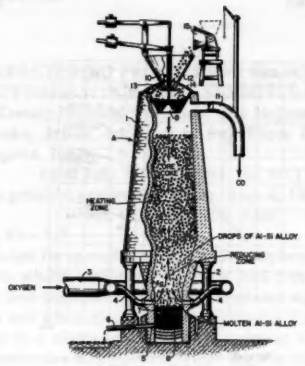
The invention particularly provides for a method of controlling the manganese content of the melt at turn-down of a steel refining process by at least a two stage process in which the refining is carried out using a gas stream comprising the products of combustion of a fuel and uncombined oxygen by varying the proportions of combustion products to uncombined oxygen in a first stage in which the gas stream is relatively poor in uncombined oxygen and in a subsequent or second stage in which the gas stage is relatively rich in uncombined oxygen and varying the duration of the first stage so that with a relatively long first stage a low manganese reversion is obtained and by providing a relatively short first stage a high manganese reversion to the melt at turn-down is obtained.

3,661,561

METHOD OF MAKING ALUMINUM-SILICON ALLOYS

Frederick W. Frey, Jr.; Donald O. Hutchinson, and Kishan K. Seth, all of Baton Rouge, La., assignors to Ethyl Corporation, New York City, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,425
Int. Cl. C22b *21/02, 5/10*
U.S. Cl. 75—68 R 12 Claims



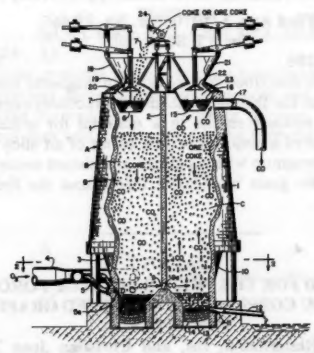
A method of making aluminum-silicon alloy in a blast furnace utilizing substantially pure oxygen, wherein lumps of silicon carbide comprise all or part of the furnace bed.

3,661,562

REACTOR AND METHOD OF MAKING ALUMINUM-SILICON ALLOYS

Kishan K. Seth, and Carroll W. Lanier, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,766
Int. Cl. C22b *21/02, 5/10*
U.S. Cl. 75—68 R 17 Claims



A reactor or blast furnace adapted for the production of an aluminum-silicon alloy, wherein two separate reaction zones are provided. Coke or other suitable carbonaceous material is fed into one reaction zone and a mixture of coke and alumina-silica ore is fed into the second reaction zone. Substantially pure oxygen, a supporter of combustion, is introduced into the reaction zone or section containing coke for combustion. Hot carbon monoxide gases produced by the coke combustion are introduced into the second reaction zone or section containing ore and coke for reducing the ore. A suitable opening is provided in the wall separating the two reaction zones for permitting the hot carbon monoxide to move from one reaction zone to the other. The reaction zone in which the ore is reduced includes a suitable tap-hole for drawing off of molten aluminum-silicon alloy.

3,661,563

CYCLIC LEACH-PRECIPITATION PROCESS FOR RECOVERING COPPER VALUES FROM BODIES OF ORE MATERIAL CONTAINING COPPER MINERALS

Henry Rush Spedden, and Emil Edward Malouf, both of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,578
Int. Cl. C22b *15/12*
U.S. Cl. 75—101 R 8 Claims

As part of a cyclic, copper leaching-precipitation process, an aqueous solution containing reducing ions selected from the group consisting of sulfite ion and bisulfite ion is injected into a body of copper ore material at a location or locations adjacent the emergence from such body of an applied acidic leach solution containing ferric ions and pregnant with copper values, for reducing ferric ions in such leach solution to ferrous ions so consumption of metallic iron in the precipitation stage is minimized. The injection site or sites are removed from access of atmospheric air, and injection is carried out in the absence of oxygen to prevent auto-oxidation of the reducing agent. Such agent acts as a bacteriacide to eliminate anaerobic, hydrogenase-producing strains of bacteria normally present, which bacteria would otherwise reduce sulfates and produce hydrogen sulfide to thereby effect precipitation of soluble copper into insoluble copper sulfide. Additionally, the reducing agent inhibits the action of autotrophic aerobic bacteria normally present in areas penetrated by atmospheric air and thereby minimizes oxidation of ferrous ions to ferric.

3,661,564

EXTRACTION OF COBALT AND NICKEL FROM LATERITE

Louis Gandon; Christian Bozec; Philippe Lenoble; Robert Lemarinel, all of Le Havre, and Pierre Fer, Caucriauville Le Havre, all of France, assignors to Le Nickel, Paris, France

Filed Nov. 16, 1970, Ser. No. 89,915
Claims priority, application France, Nov. 19, 1969, 6939777; Dec. 19, 1969, 6944050
Int. Cl. C22b *23/04*
U.S. Cl. 75—101 R 9 Claims

A method for the recovery of nickel and cobalt from laterite with the elimination of iron, wherein the laterite is divided into a major and a minor portion and the minor portion is treated with hydrochloric acid to form a suspension. The major portion of laterite is mixed with the suspension to form a slurry which is roasted to form cobalt and nickel chloride. The nickel and cobalt chlorides are then dissolved by treating the solid residue with water, ferric chloride remaining in the residue. The solution is then subjected to a recovery treatment including cation exchange to separate the cobalt and nickel ions, and reduction to produce cobalt and nickel.

3,661,565

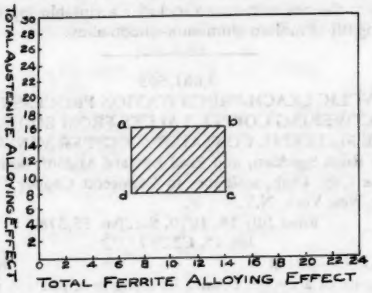
PRECIPITATION HARDENING STEEL

Richard F. Harvey, Orchard Lake, Mich., assignor to Metaltronics, Inc., Orchard Lake, Mich.

Continuation-in-part of application Ser. No. 559,679, June 20, 1966, now abandoned. This application Aug. 4, 1969, Ser. No. 855,065
Int. Cl. C22c *39/20, 41/02*
U.S. Cl. 75—125 4 Claims

A low carbon, precipitation hardening steel characterized by good room temperature and good high temperature pro-

perties, said steel containing as essential elements about 0.20 percent carbon, 1.50 percent chromium, 1.75 percent nickel,



2.00 percent molybdenum, 2.65 percent copper, and the balance substantially iron with residual elements in normal amounts.

3,661,566

PROCESS FOR THE TREATMENT OF NODULAR CAST IRON

Jean-Claude G. Percheron, and Louis Septier, both of Chedde, France, assignors to Compagnie Pechiney, Paris, France, by said Percheron

Filed Sept. 30, 1969, Ser. No. 862,343
Claims priority, application France, Oct. 2, 1968, 168451
Int. Cl. C22c *23/00, 37/04*
U.S. Cl. 75—130 R **4 Claims**

A process for the treatment of molten iron to produce castings having a graphite nodular structure in which the molten cast iron is first treated with a nodulating alloy containing magnesium and boron and then with an inoculating alloy containing silicon and barium.

3,661,567

MAGNET ALLOYS

Hiroshi Yamamoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 429,260, Feb. 1, 1965, now abandoned. This application Dec. 6, 1967, Ser. No. 688,502
Int. Cl. H01f *1/04;* **C22c** *31/00*
U.S. Cl. 75—134 M **1 Claim**

A ternary permanent magnet alloy which is composed of 69.5 to 73.0 percent by weight of Mn, 26.4 to 29.5 percent by weight of Al and 0.6 to (1/3 Mn—22.16) percent by weight of C, and primarily consists of a body-centered tetragonal structure phase, and which has magnetic characteristics of $BHmax \geq 1.0 \times 10^6$ G.Oe, $Br \geq 2{,}800$ G. and $BHc \geq 1{,}400$ Oe., excellent magnetic stability, mechanical properties, weather resistance and corrosion resistance, and are not susceptible to spontaneous disintegration in the atmosphere.

3,661,568

COPPER BASE ALLOY

Charles D. McLain, Alton, Ill., assignor to Olin Corporation

Continuation-in-part of application Ser. No. 648,953, June 26, 1967, now abandoned. This application June 29, 1970, Ser. No. 50,893. The portion of the term of the patent subsequent to July 28, 1987, has been disclaimed.
Int. Cl. C22c *9/00, 9/04*
U.S. Cl. 75—157.5 **10 Claims**

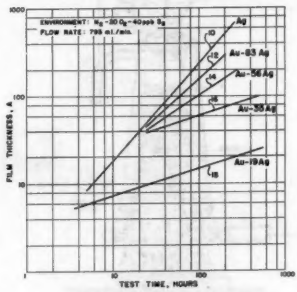
The present disclosure teaches an improved copper base alloy containing iron and manganese and a material selected from the group consisting of phosphorus and zinc and mixtures thereof. The alloys of the present invention are characterized by improved physical properties, in particular high strength and high conductivity.

3,661,569

LOW ENERGY CONTACTS

William H. Abbott, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed June 19, 1969, Ser. No. 834,796
Int. Cl. C22c *5/00*
U.S. Cl. 75—165 **7 Claims**



Tarnish Rates Of Au-Ag Alloys In Flowers Of Sulfur At 30° C

High silver content (30 percent, by weight, or greater) gold base alloys are found to have exceptional resistance to silver sulfide tarnish when alloyed with from 0.25 to 10 percent, by weight, indium or preferably indium and cadmium each within the range of 0.25 to 10 percent and such alloys including those containing cadmium alone have been found to exhibit exceptional resistance to carbon film deposits in normal low energy switch applications and frictional polymer formation in sliding low energy applications.

3,661,570

MAGNETIC HEAD MATERIAL METHOD

Herbert Irwin Moss, Yardley, Pa., assignor to RCA Corporation

Filed Apr. 3, 1970, Ser. No. 25,465
Int. Cl. B22f *1/00*
U.S. Cl. 75—206 **7 Claims**

A process is described for providing a magnetic transducer material useful for the signal heads of a recorder-reproduced system. The process results in a material for a head core which consists of a majority or first phase of an alloy of iron, silicon and aluminum with an abrasion resistant second phase disposed in the grain boundaries throughout the first phase material.

3,661,571

METHOD FOR THE PREPARATION OF POROUS METALLIC COPPER WITH DISPERSED GRAPHITE PARTICLES

Hans Erich Hintermann, Ins, and Christian Jean Triquet, Neuchatel, both of Switzerland, assignors to Laboratoire Suisse de Recherches Horlogeres, Neuchatel, Switzerland

Filed July 12, 1968, Ser. No. 744,323
Claims priority, application Switzerland, Aug. 18, 1967, 11625
Int. Cl. B22f *9/00*
U.S. Cl. 75—201 **4 Claims**

A method for the preparation of a solid product characterized in that particles of a solid material homogeneously dispersed in a porous metallic mass is prepared in a liquid containing a metal dissolved in the form of a compound solu-

ble in the liquid, the dispersion being mixed with a reagent capable of precipitating a compound of the metal so that at least a portion of the particles is entrapped in the precipitate in a uniformly dispersed state, the precipitate containing the dispersed particles being separated from the other constituents of the mixture, and the precipitate subjected to a treatment of reduction or thermal dissociation of a temperature which is below the melting point of the metal constituting the mass, to convert the compound of the metal directly into a solid elementary metal and into a vaporized by-product without any physical or chemical alteration of the dispersed phase.

3,661,572

MANUFACTURING PROCESS FOR MANUFACTURING ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL

Yasuo Tamai; Masaaki Takimoto, and Hajime Miyatuka, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed July 31, 1970, Ser. No. 60,118
Claims priority, application Japan, Aug. 4, 1969, 44/61018
Int. Cl. G03g *5/00, 7/00*
U.S. Cl. 96—1.7 **7 Claims**

A process for manufacturing an electrophotographic sensitive layer which comprises adding a lead compound soluble in water and capable of generating lead ions upon dissolution in water and a water-soluble, sensitizing dye having a carboxyl group to a slurry prepared by dispersing a finely divided photoconductive zinc oxide in water thereby allowing the dye to be deposited fast on the surface of the zinc oxide so as to give rise to a colored zinc oxide powder, washing the powder with water, subsequently blending the colored powder which may be optionally mixed with untreated zinc oxide powder with an insulative resin, and spreading the resultant mixture in the form of a layer on a base having an electroconductive surface.

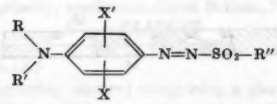
3,661,573

LIGHT-SENSITIVE COMPOUNDS

Urbain Leopold Laridon, Wilrijk; Gerard Albert Delzenne, 's-Gravenwezel, and Hugo Karel Peeters, Berchem, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Oct. 9, 1969, Ser. No. 865,185
Claims priority, application Great Britain, Nov. 26, 1968, 56,095/68
Int. Cl. G03c *1/52;* **G03f** *7/02, 7/08*
U.S. Cl. 96—33 **10 Claims**

A copying material for use in the photochemical preparation of printing plates comprises a support and a light-sensitive coating formed from an intimate mixture of an alkali-soluble polymer and a compound of the formula:



wherein:

R = hydrogen, alkyl or phenyl;

R′ = alkyl, phenyl, naphthyl, benzoyl, alkoxybenzoyl, acryloyl, methacryloyl or alkylsulphonylaminoalkyl;

R″ = phenyl, alkylphenyl, aminophenyl, dialkylaminophenyl or acylaminophenyl;

X = hydrogen, halogen, nitro, alkyl or alkoxy;

X′ = hydrogen, halogen, or alkoxy.

On image-wise exposure to actinic light and dissolving the exposed portions of the coating in an aqueous alkaline liquid, a positive printing plate is formed.

3,661,574

PHOTOGRAPHIC PROCESS WITH AN AMINE METAVANADATE

Francois-Jean-Marie Bredoux, and Rene Fernand Pierre Garcia, both of Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1969, Ser. No. 851,101
Claims priority, application France, Dec. 18, 1968, 178794
Int. Cl. G03c *5/00*
U.S. Cl. 96—35 **12 Claims**

There is described photosensitive elements which employ as the photosensitive component organic amine metavanadates and processes of producing photographic images and reliefs with these photosensitive elements.

3,661,575

GRAVURE PRINTING PLATE OF PHOTOCURABLE MATERIAL

Arthur D. Ketley, Columbia, and Joseph A. Cogliano, Baltimore, both of Md., assignors to W. R. Grace & Co.

Filed Jan. 5, 1970, Ser. No. 828
Int. Cl. G03c *5/00*
U.S. Cl. 96—35.1 **3 Claims**

This invention relates to a gravure printing plate and methods of making same, said plate comprising a photocurable composition, i.e., a polyene, polythiol and photosensitizer, optionally having a screen or grid embedded in the photocurable composition.

3,661,576

PHOTOPOLYMERIZABLE COMPOSITIONS AND ARTICLES

Edward N. Crary, Pewaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Feb. 9, 1970, Ser. No. 9,857
Int. Cl. G03c *1/68*
U.S. Cl. 96—35.1 **14 Claims**

Photopolymerizable articles and compositions incorporating ethylenically unsaturated polyhydroxy diester polyethers as the active photopolymerizable ingredient, more specifically, acrylic and methacrylic diesters of diepoxy polyethers derived from aromatic polyhydroxy compounds. The articles and compositions are useful for dry photoresist films, for the manufacture of etched printing plates, as resist materials for chemical milling, and other uses which may utilize a photoactive layer or stratum.

3,661,577

METHOD FOR FORMING DIES

Carl John Klemm, Appleton, Wis.; Richard August Tietz, Streamwood, Ill.; Terrell Ray Street, Houston, Tex., and Trevor Blake, Lawrenceville, N.J., assignors to American Can Company, New York, N.Y.

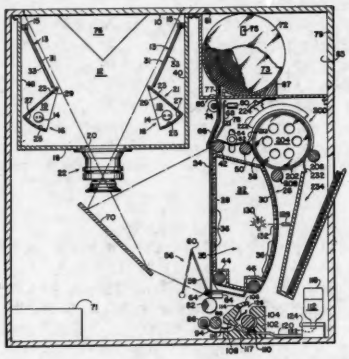
Filed Mar. 12, 1968, Ser. No. 712,526
Int. Cl. G03c *5/04, 5/00*
U.S. Cl. 96—36 **21 Claims**

A die for cutting paperboard material or the like comprises a pair of die plates having coacting cutting elements which partially overlap in the plane of the material to be cut. In making the die plates, a first image representing the critical overlap portion of the cutting elements is utilized to obtain a second and third image each representing a complete cutting element. The second and third image each includes an overlap portion derived from a common image source thereby to facilitate accuracy of registry of two matching die plates ultimately derived from said second and third images.

3,661,578
DRYER

Paul B. Mason, Magnolia, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 722,855, Apr. 22, 1968, abandoned. This application Apr. 1, 1969, Ser. No. 812,259
Int. Cl. G03c 5/54
U.S. Cl. 96—29 5 Claims



A dryer for photographic sheet material having an image-receptive layer. The dryer includes a support having a covering thereon adapted to contact and support the photographic sheet with the image-receptive layer in contact with the covering. The dryer also includes means for advancing the covering and photographic sheet past a heated platen located in contact with the side of the photographic sheet opposite the side in contact with the covering for vaporizing liquid previously absorbed into the sheet during processing thereof and driving the vapor into the covering from which it is subsequently removed.

3,661,579
METHOD FOR RECORDING AND REPRODUCING GRAPHIC INFORMATION ON PROCESSED PHOTOGRAPHIC MATERIAL

Marcel Nicolas Vrancken, Hove; Louis Achilles Meeussen, and Daniel Alois Claeys, both of Mortsel, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

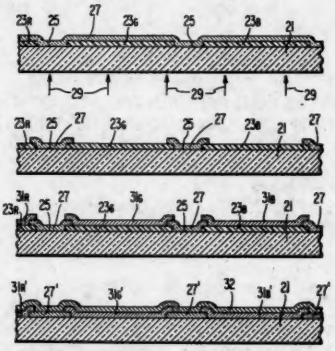
Filed May 13, 1968, Ser. No. 728,574
Claims priority, application Great Britain, May 12, 1967, 22,221/67
Int. Cl. G03c 5/00, 5/44
U.S. Cl. 96—36 17 Claims

Recording layers of the type disclosed in U.S. Pat. No. 3,476,937 are used for subtitling photographic film, particularly motion picture film. A heat and/or pressure sensitive layer of such type is applied as an over-coating on the film to be subtitled, exposed to a heat pattern according to the subtitle so as to reduce the water permeability of the heated areas thereof, contacted with an aqueous liquid chemically degrading the binder in such layers so that the layer is removed in the heated areas, after which the film which carries the developed photographic image in a conventional emulsion layer thereon is contacted with a liquid, which may be the same liquid used to chemically degrade the overlayer, which either degrades the binder of the conventional emulsion layer to permit removal thereof or bleaches the visible image-forming material, i.e., the developed silver image or colored dye image, in the emulsion layer, the degradation or bleaching effect taking place in the areas where the overlayer has been removed. The remaining areas of the overlayer can be finally removed by rubbing the same while wet with an aqueous liquid.

3,661,580
PHOTOGRAPHIC METHOD FOR PRODUCING A CATHODE-RAY TUBE SCREEN STRUCTURE

Edith Ellen Mayaud, Lancaster, Pa., assignor to RCA Corporation

Filed Jan. 30, 1970, Ser. No. 7,138
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 9 Claims

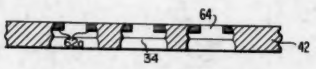


A method for preparing a screen structure comprising a light-absorbing layer or matrix having therein an array of discretely-sized holes filled with luminescent material. A stencil having an array of opaque areas, which areas are larger than the desired holes, is produced on a supporting surface. A photopolymeric film is deposited over the stencil and supporting surface, and light is passed through the surface and stencil, thereby exposing the film. The light in the film is scattered so that the exposed areas extend behind the opaque areas of the stencil producing unexposed areas in the film which are substantially the same size as the desired holes. The unexposed areas of the film and the opaque portions of the stencil are removed, while the exposed areas of the film are retained in place. The retained exposed areas are rendered light-absorbing and the holes therein are filled with luminescent material.

3,661,581
METHOD FOR PHOTODEPOSITING SMALLER SIZE IMAGE SCREEN AREAS FOR CATHODE RAY TUBE FROM LARGER SIZE MASK APERTURES

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation

Filed Dec. 30, 1969, Ser. No. 889,238
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 8 Claims



A method for producing a color kinescope having an image screen and a color selection mask having final-size apertures that are temporarily reduced in size for use as a photographic master in producing the image screen. The method includes providing a substrate having apertures of final size; providing at one surface of the substrate a perforated layer of electroless deposition-initiating material, portions of the layer partially extending across the apertures; electrolessly depositing a suitable material at these portions of the layer to produce opaque light-barriers that define respective light-transmitting corridors; providing the image

screen by photographic exposure through the corridors; removal of the light-barriers to restore the apertures to their original condition and provide the final mask; and incorporation of the mask and image screen into a kinescope.

3,661,582

ADDITIVES TO POSITIVE PHOTORESISTS WHICH INCREASE THE SENSITIVITY THEREOF

Barret Broyde, Highland Park, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 833,077, June 13, 1969, now abandoned. This application Mar. 23, 1970, Ser. No. 21,989

Int. Cl. G03c

U.S. Cl. 96—36.2 **14 Claims**

The use of a scanning electron beam to generate a pattern in a positive photoresist is known. Electron beam equipment can be made which is capable of scanning very quickly, but standard positive photoresists require such a large flux of electrons for proper exposure that the scanning equipment must be operated at speeds substantially slower that the capability of the equipment. It has been discovered that by adding certain compounds to photoresists of the quinone diazid type, the sensitivity or speed of the photoresist is substantially increased. As a result, the electron beam can scan at a higher rate. The same compounds also increase the sensitivity of the photoresist to light. Compounds which are operable include aromatic compounds soluble in the resist and having two or more nitrogen atoms, at least one of which is bonded to a hydrogen atom. The ring can contain no other heterocyclic atoms and the nitrogens can not be bonded to other than nitrogen, carbon or hydrogen atoms. This definition includes most, but not all, of the compounds which have been determined to be operable.

3,661,583

THERMAL DESENSITIZATION OF PHOTOSENSITIVE SYSTEMS

Peter C. Van Der Voorn, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,092

Int. Cl. G03c *5/24*

U.S. Cl. 96—48 **20 Claims**

Exposed photosensitive elements are thermally desensitized to stabilize the image produced thereon.

3,661,584

PROTEINACEOUS COLLOID COMPOSITIONS PROVIDED ON GLASS SUPPORTS

Walter August Van Den Heuvel, Berchem; Jozef Frans Willems, Wilrijk; Herman Adelbert Philippaerts, Mortsel; Roland Francois Beels, Linkebeek, and Renaat Frans Heylen, Deurne, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Nov. 10, 1969, Ser. No. 875,570

Claims priority, application Great Britain, Nov. 18, 1968, 54,678/68

Int. Cl. G03c *1/76*

U.S. Cl. 96—67 **20 Claims**

A photographic element comprising a glass support and a photosensitive emulsion layer on said support comprising a film-forming proteinaceous colloid is described. The adherence of the emulsion layer to the glass support is enhanced by including the emulsion layer an organic silicon compound having hydrocarbon groups directly or indirectly attached to a silicon atom wherein at least one of the hydrocarbon groups carries a group or atom which has chemical affinity for the free reactive groups of the proteinaceous colloid or which can be cross-linked to the free reactive groups through the intermediary of a cross-linking agent. The adherence of the photosensitive emulsion layer to the glass support is enhanced without affecting the photosensitive properties of the emulsion layer.

3,661,585

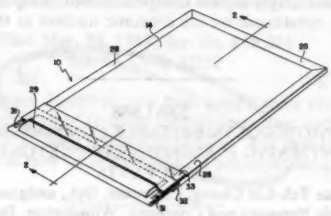
PHOTOGRAPHIC DIFFUSION TRANSFER COLOR PROCESS AND FILM UNIT FOR USE THEREIN

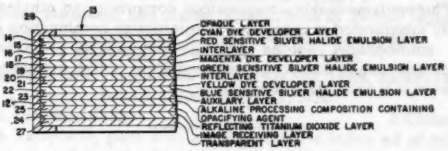
Sheldon A. Buckler, Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 19, 1970, Ser. No. 3,646

Int. Cl. G03c *7/00, 5/54*

U.S. Cl. 96—3 **46 Claims**





The present invention relates, in general, to a permanently structured composite photographic film unit, adapted to provide a color diffusion transfer image, which includes an opaque layer; a photosensitive silver halide layer having associated dye transfer image-forming material; a processing composition permeable layer comprising a particulate dispersion of visible light-reflecting inorganic pigment possessing a first mean particle size, which transmits actinic radiation incident on the layer effective to expose the photosensitive silver halide layer, and which dispersion upon contact with alkaline processing composition provides a dispersion of the pigment possessing a second mean particle size, effective to reflect incident actinic radiation and to thereby mask dye transfer image-forming material associated with the photosensitive silver halide layer; a polymeric layer dyeable by the dye transfer image-forming material; a transparent layer; and a rupturable container retaining alkaline processing composition for distribution between the dyeable polymeric layer and next adjacent photosensitive silver halide layer.

3,661,586

LEAD IODINE FILM

John H. Jacobs, Altadena, and Richard A. Corrigan, Pasadena, both of Calif., assignors to Bell & Howell Company

Filed Feb. 20, 1970, Ser. No. 12,914

Int. Cl. G03c *5/24, 1/00*

U.S. Cl. 96—48 **10 Claims**

A lead iodide photographic film having photosensitivity which is low at room temperature but which can be portionally increased. Precursors of the lead iodide can be coated in separate layers on a film support. A dry developing agent, such as ascorbic acid, and a heat trigger, such as acetamide, can be incorporated to enhance the temperature sensitive photoresponse of the film. The image can be fixed with an alkaline solvent or by plating a more noble metal on the lead, such as copper. A method and mechanism are disclosed for add-an-image exposure and processing.

3,661,587
PHOTOGRAPHIC MEDIA
Howard Adrian, Sudbury, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Apr. 1, 1968, Ser. No. 717,976
Int. Cl. G03c 1/48
U.S. Cl. 96—76 13 Claims

In photographic elements comprising a reversibly activated photoconductor and incorporating a photographic reducing agent, increased shelf life results from using an N-(carboxy-substituted alkyl) aniline compound containing an amino or hydroxy substituent on the aromatic nucleus as the reducing agent.

3,661,588
PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING *P* AMINOPHENYL KETONES AND ADJUVANTS
Catherine Teh-Lin Chang, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 18, 1969, Ser. No. 877,853
Int. Cl. G03c 1/70
U.S. Cl. 96—86 P 13 Claims

Photopolymerizable compositions comprising an ethylenically unsaturated monomer and an initiating combination of an aminophenyl ketone and a free-radical producing hydrogen donor compound selected from active methylene compounds and amino compounds.

3,661,589
INTERFACIAL VESICULAR PRINT MATERIALS AND METHODS OF PREPARATION
Norman T. Notley, P. O. Box 462, Sierra Madre, Calif.
Filed Feb. 18, 1970, Ser. No. 12,468
Int. Cl. G03c 1/54
U.S. Cl. 96—91 8 Claims

This invention is directed to a method of preparing a light sensitive vesicular imaging film wherein two resin solutions, at the threshold of compatibility but having a common or miscible solvents, each containing a sensitizer which liberates gas on irradiation are mutually dispersed, coated as a thin film and dried. The thermoplastic film comprises an intimate dispersion of one hydrophobic resin in the other hydrophobic resin with the sensitizer essentially uniformly dispersed throughout. After irradiation with a pattern of actinic light, gas released in the selected areas may be developed by overall heating to a visible record. The vesicular image in this two phase hydrophobic composition is of particularly high density and thermal stability.

3,661,590
TWO COMPONENT DIAZO-TYPE DEVELOPING PROCESS
William S. Murphy, Jr., and Edward Bialczak, both of Mount Prospect, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Continuation of application Ser. No. 639,626, May 19, 1967, now abandoned. This application Aug. 14, 1970, Ser. No. 63,897
Int. Cl. G03c 5/34, 1/60
U.S. Cl. 96—49 5 Claims

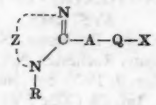
A two component diazo-type copy sheet having a light sensitive coating formulation which includes an azo coupling component, a coupling diazo compound and a metal salt such as cadmium sulfate, manganese sulfate, nickel sulfate and zinc sulfate which acts to substantially speed up the azo dye formation upon the application of controlled amounts of an organic amine. The metal salt is present in the range of 1 to 3 percent by weight of the sensitizing solution. Ethanolamine is typical of the developing liquids.

3,661,591
DIAZOTYPE MATERIALS
Peter William Maurice Reed, Hockley, England, assignor to Ozalid Company Limited, Loughton, Essex, England
Filed Mar. 24, 1970, Ser. No. 22,391
Claims priority, application Great Britain, Mar. 28, 1969, 16,418/69
Int. Cl. G03c 1/52
U.S. Cl. 96—91 4 Claims

A diazotype material for use in making copies of X-ray films which comprises a support carrying a light-sensitive layer containing at least one diazonium compound, a coupler and a non-light-sensitive ultra-violet absorber, the ultra-violet absorber being effective in screening out radiation in the range of 3,400 to 4,000 A, being transparent to all radiation at or above 4,300 A and being present in an amount such as to give a background absorbance of at least 0.9 at 4,000 A.

3,661,592
PHOTOGRAPHIC FINE GRAIN SILVER HALIDE MATERIALS
Herman Adelbert Philippaerts, Mortsel; Robert Joseph Poliet, Vremde; Jozef Frans Willems, Wilrijk, and Frans Henri Claes, Edegem, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium
Filed Oct. 2, 1970, Ser. No. 77,694
Claims priority, application Great Britain, Nov. 6, 1969, 54,539/69
Int. Cl. G03c 1/02
U.S. Cl. 96—94 4 Claims

A method of preparing a photographic fine-grain silver halide emulsion is described wherein precipitation of the silver halide occurs in the presence of a compound corresponding to the formula:



wherein Z represents the atoms necessary to complete an imidazole, benzimidazole or naphthimidazole nucleus; Q is sulphur or selenium; R is hydrogen, C_1-C_4 alkyl or aryl, A is alkylene, which may be interrupted by hetero atoms, –S-alkylene which may be interrupted by hetero atoms, or arylene and X is alkyl, alkenyl or aryl or A and X together with Q represent the atoms necessary to complete a non-nitrogen containing heterocycle. By the presence of these compounds during precipitation of the silver halide homogeneous Lippmann-emulsions can be prepared with an average grain-size of less than 50 nm.

3,661,593
PROTEIN CONCENTRATES FROM BUFFER TREATED CEREAL ENDOSPERM PRODUCTS
Donald D. Christianson, Peoria; Arthur C. Stringfellow, Washington, and Joseph S. Wall, Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture
Filed Apr. 24, 1970, Ser. No. 31,542
Int. Cl. A23j 1/12; A23d 6/00
U.S. Cl. 99—17 8 Claims

An improvement has been made in processes for preparing protein enriched products from cereal grains. Protein which envelopes starch particles in cereal endosperm is loosened by hydration in an aqueous buffer solution. Standard commercial procedures such as grinding, milling, air classification, or screening can be used to prepare the desired products.

3,661,594

PRODUCTION OF BACTERIAL RENNET FOR MAKING CHEESE

Tomio Imai, Tokyo; Yoshio Irie, Matsudo, and Yoshinobu Kanazawa, Soka, all of Japan, assignors to Godo Shusei Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of application Ser. No. 724,455, Apr. 26, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 618,391, Feb. 24, 1967, now abandoned. This application Jan. 16, 1970, Ser. No. 3,490
Claims priority, application Japan, Feb. 26, 1966, 41/11338
Int. Cl. A23c *19/02*; C07g *7/028*
U.S. Cl. 99—116 7 Claims

Milk coagulating enzyme preparation is provided herein by a process comprising culturing a strain of Bacillus polymyxa on a nutrient medium containing assimilable carbon source and inorganic salts. The enzyme "bacterial rennet" produced by the aforementioned process is also employed herein as a milk coagulating enzyme useful for making cheese.

3,661,595

COMPOSITION FOR METALIZING CERAMIC

Robert W. Buck, Wheat Ridge, Colo., assignor to Coors Porcelain Company, Golden, Colo.

Filed Feb. 16, 1970, Ser. No. 11,869
Int. Cl. C09d *5/24*
U.S. Cl. 106—1 4 Claims

The subject matter of this invention is a composition and method for metalizing ceramic wherein the composition is a mixture containing manganese, molybdenum and silicon, at least a portion of the latter being present as molybdenum disilicide or tungsten disilicide, molybdenum disilicide being much preferred. The mixture, in powdered form, is suspended in an organic vehicle to provide a slurry which is coated onto the ceramic after which the ceramic is fired in a wet reducing atmosphere to a temperature of about 1150°C to 1450°C, the organic vehicle vaporizing during the initial phase of the firing operation. By inclusion of the disilicide in the mixture an improved metalized surface on the ceramic can be accomplished using relatively a low firing temperature.

3,661,596

STABILIZED, CHEMICAL NICKEL PLATING BATH

Wolfgang Clauss, and Dieter Menz, both of Berlin, Germany, assignors to Schering AG, Berlin, Germany

Filed Apr. 29, 1970, Ser. No. 33,088
Claims priority, application Germany, May 22, 1969, P 19 26 100.8
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 5 Claims

A stabilized chemical bath containing a solution of a nickel salt and selenium compounds as stabilizers.

3,661,597

ELECTROLESS COPPER PLATING

Michael Gulla, Newton, Mass., assignor to Shipley Company, Inc., Newton, Mass.

Filed May 20, 1971, Ser. No. 145,508
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 27 Claims

The invention is directed to an electroless copper solution characterized by inclusion of a polyether adduct of an alkine alcohol and an alkylene oxide for improved solution stability and deposit appearance.

3,661,598

CONVERSION OF ELECTROSTATIC LITHOGRAPHIC MASTERS AND COMPOSITION

Helen M. Rosenberger, Skokie, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed May 21, 1970, Ser. No. 39,502
Int. Cl. C09k *3/00*
U.S. Cl. 106—2 6 Claims

A conversion solution for electrostatic lithographic masters wherein the conversion solution is formulated to contain ferrocyanide in solution and which is stabilized by the presence of dissolved sulfite.

3,661,599

HIGH TEMPERATURE TIC-VC STRUCTURAL MATERIALS

Graham E. Hollox, Baltimore; Walter Precht, Towson; Robert G. Lye, Towson, and Albert R. C. Westwood, Towson, all of Md., assignors to Martin Marietta Corporation, New York, N.Y.

Filed Mar. 25, 1969, Ser. No. 810,301
Int. Cl. C04b *35/52*
U.S. Cl. 106—43 6 Claims

The invention describes new high temperature structural materials consisting of titanium carbide vanadium carbide alloys produced by zone refining techniques. The materials are fully dense and may be either mono- or polycrystalline.

3,661,600

OPTICAL GLASS WITH A HIGH REFRACTIVE INDEX AND A HIGH DISPERSING ABILITY

Tetsuro Izumitani, and Kazuo Namiki, both of Tokyo, Japan, assignors to Hoya Glass Works, Limited, Tokyo, Japan

Filed Nov. 3, 1969, Ser. No. 873,678
Claims priority, application Japan, Nov. 20, 1968, 43/85118
Int. Cl. C03c *3/00*, *3/12*, *3/30*
U.S. Cl. 106—47 Q 2 Claims

A TeO_2-WO_3 glass with a high refractive index ηd of not lower than 2.0 and a high dispersing ability represented by Abbe's number of 21 or less, and having a greatly improved stability with respect to both devitrification and chemical durability, can be obtained by the inclusion, in the composition of the glass, of Li_2O and at least one other oxide selected from the group consisting of K_2O, MgO, BaO, ZnO, CdO, TiO_2, PbO, La_2O_3, B_2O_3, Nb_2O_5 and Bi_2O_3.

3,661,601

OPAL GLASS COMPOSITIONS

William H. Dumbaugh; James E. Flannery, and George B. Hares, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 21, 1969, Ser. No. 809,317
Int. Cl. C03c *3/04*, *3/08*
U.S. Cl. 106—54 3 Claims

This invention relates to spontaneously opacifiable glasses containing fluorine and having as the principal opacifying phase an immiscible, or insoluble, fluorine containing glass; the opal is an alkali aluminosilicate glass with additions of divalent oxides, fluorine, and boric-oxide. These glasses are opacified by cooling the glass body from the melt to a temperature below about the opal liquidus thereof at a rate greater than about 2° C./minute so as to homogeneously separate an insoluble glassy opacifying phase.

3,661,602

SILANE-STABILIZED SILICATE FOAMS

Stephen A. Gerow, Glen Mills, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 13, 1970, Ser. No. 54,573
Int. Cl. C04b *35/16*
U.S. Cl. 106—75 13 Claims

Stable aqueous foams prepared from aqueous solutions of alkaline ionic silicates containing a cationic surface-active onium compound and an alkyl silane, and optionally containing colloidal amorphous silica and a latent acid or salt gelling agent. Rigid foams are obtained by setting the aqueous foams with a salt or acid, then drying the set foam. Inclusion of the silanes increases foamability of the solution, stability of the wet foam, and water resistance and strength of the dried foam.

3,661,603

NOVEL LIGHTWEIGHT ASBESTOS CONTAINING CEMENTITIOUS MATERIAL AND PROCESS FOR PRODUCING THE SAME

John Paul Nicol, Thetford Mines, Quebec, Canada, assignor to Asbestos Corporation Limited, Thetford Mines, Quebec, Canada

Filed Apr. 7, 1970, Ser. No. 26,415
Claims priority, application Great Britain, Apr. 8, 1969, 17,905/69
Int. Cl. C04b *31/04, 31/40*
U.S. Cl. 106—90 24 Claims

A lightweight, rigid composition is prepared by a process comprising mixing water, a cementitious material, asbestos fibers and an anionic surfactant capable of chemically opening the fiber and resistant to alkalis and saponification. The product may be cellular, in which case it may additionally include a different surfactant, a sequestering agent or a colloidal dispersion.

3,661,604

LIGHT-WEIGHT CONCRETE MATERIAL AND PROCESS FOR PRODUCING THE SAME

Paul Artmann, Maxingstrasse 38, Wien 13, Austria

Filed Aug. 12, 1969, Ser. No. 849,345
Claims priority, application Austria, June 3, 1969, A 5320/69
Int. Cl. C04b *31/20*
U.S. Cl. 106—98 1 Claim

A light-weight concrete having a density of 800 – 1,800 kg/m³ consists essentially of a coarse aggregate, a fine aggregate, cement, and water, the coarse aggregate being at least 50 percent of all solids by volume, the fine aggregates being constituted by fine said of less than 1 mm grain size, crushed mineral material such as crushed brick of less than 5 mm grain size and pulverized mineral material, such as powdered brick of a grain size of less than 2 mm.

3,661,605

RELEASE PRODUCT

Leon R. Rubin, and Arthur E. Meyerhoff, Jr., both of Chicago, Ill., assignors to American Home Products Corporation

Filed June 8, 1970, Ser. No. 44,619
Int. Cl. C08h *9/00*
U.S. Cl. 106—244 3 Claims

An aqueous aerosol composition is composed of a homogenized dispersion of lecithin in water and contains a propellant, e.g., carbon dioxide or nitrous oxide, for pressurizing the composition in an amount sufficient to produce a release coating of lecithin on a surface when the composition is sprayed. Other ingredients such as preservatives, i.e., bacteriostats and/or fungistats, and supplemental emulsifiers can be included where desired or needed.

3,661,606

PROCESS FOR PROTECTING ORGANIC MATERIAL FROM THE ACTION OF ULTRAVIOLET RAYS

Christian Luethi, Munichstein; Max Duennenberger, Frenkendorf, and Hans Rudolf Biland, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 13, 1970, Ser. No. 28,026
Claims priority, application Switzerland, Feb. 7, 1966, 1679/66; 1680/66. The portion of the term of the patent subsequent to Sept. 22, 1987, has been disclaimed.
Int. Cl. C08b *27/68;* C08f *45/60;* C08g *51/60*
U.S. Cl. 106—178 9 Claims

This invention refers to a process for protecting organic materials that can be damaged by ultraviolet rays, from the action of ultraviolet rays, wherein asymmetrical oxalic acid diarylamides of the general formula A—NH—CO—CO—N-H—B where A and B are different from each other and each represents a benzene or naphthalene residue, these residues A and B (a) being free from hydroxyl groups in the ortho-positions to the amide nitrogen atom and (b) containing if desired substituents that contain no more than 20 carbon atoms and do not displace the absorption maximum of the compound towards values above 400 mμ, are applied to said materials, as well as compositions containing said oxalic acid diarylamides.

3,661,607

REDUCTION OF DUSTINESS AND ABRADING OF SOFT POROUS LOW DENSITY HYDRATED CALCIUM SILICATE PRODUCTS

Elmer Brewington Hurley, Martinsville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,328
Int. Cl. C08h *9/06*
U.S. Cl. 106—272 10 Claims

Means of diminishing surface dusting in porous low density hydrated calcium silicate bodies and improving resistance to abrasion and crumbling of their soft, friable texture by depositing thereon a high temperature melting wax, and the dust-free and more durable wax containing hydrated calcium silicate products.

3,661,608

COMPOSITIONS FOR USE IN REFRACTORIES

Paul H. Ralston, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Aug. 18, 1969, Ser. No. 851,056
Int. Cl. C08h *17/24*
U.S. Cl. 106—286 1 Claim

Compositions comprising B_2O_3, P_2O_5, H_2O and, typically, alkali metal oxides are disclosed. These compositions are useful as binders for refractory compositions.

3,661,609

METHOD FOR PREPARING NACREOUS PIGMENTS

Harold Kaufman, Freehold, N.J., assignor to Whittaker Corporation

Filed Nov. 2, 1970, Ser. No. 86,272
Int. Cl. C09c *1/00, 1/04*
U.S. Cl. 106—291 30 Claims

Improved pearlescent pigments are prepared by combining an aqueous, divalent metal salt solution with an aqueous solution comprising an alkali metal biphosphate or ammonium phosphate and a reducing agent. The combination of solutions yields metal acid phosphate or metal ammonium phosphate in crystalline form with a portion of the metal reduced to the free metallic state. The metal acid or ammonium phosphate crystals are plated onto the surface of mica or similar material at the time of formation in the presence of a cationic wetting agent within the aqueous reaction media.

3,661,610

PIGMENT

Andrew Paul Ferris, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England

Filed Sept. 8, 1970, Ser. No. 70,104
Claims priority, application Great Britain, Sept. 10, 1969, 44,700/69
Int. Cl. C09c *1/02, 1/28*
U.S. Cl. 106—306 16 Claims

A mixed clay/calcium carbonate pigment wherein the clay pigment component has associated therewith before being mixed with the calcium carbonate pigment component a water-soluble condensed phosphate dispersing agent and a second dispersing agent which is a water-soluble salt comprising an organic macromolecular anion, for example a salt of polyacrylic or polymethacrylic acid, and wherein the calcium carbonate pigment component has associated therewith

before being mixed with the clay pigment component said second dispersing agent.

3,661,611

AZO COMPOUNDS

Fred Dawson; John Mitchell; Leslie Richard Rogers; William Todd, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Original application May 23, 1966, Ser. No. 551,923, now Patent No. 3,532,520. Divided and this application May 1, 1970, Ser. No. 33,918

Int. Cl. C08h *17/14*

U.S. Cl. 106—308 Q 6 Claims

A composition readily dispersible in an organic solvent and containing an azoacylacetarylamide and an azo compound of the formula

$$X\left[N=N-\underset{\displaystyle CONHZ}{\underset{|}{CH}}-\overset{\displaystyle Y}{\overset{|}{C}}=NR\right]_n$$

wherein X is selected from the group consisting of phenyl, diphenyl and quinoline radicals and is directly linked to the azo group through a nuclear carbon atom of said radicals, said radicals optionally carrying a substituent selected from the group consisting of chlorine, nitro, methyl and hydroxy, Y is methyl, Z is phenyl optionally substituted with a member selected from the group consisting of methoxy and methyl, R is a radical selected from the group consisting of alkyl, alkene, aminoalkyl and cyclohexyl and *n* is an integer of 1–2.

3,661,612

METHOD OF COATING A MOVING METAL STRIP

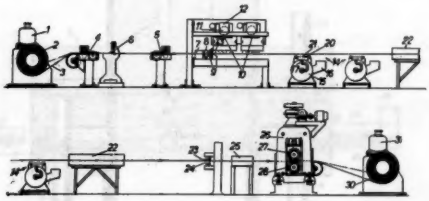
Albert Edward Jackson, Wendover, Gwernaffield Mold, and Phillip Haydn Hughes, Wrexham, both of England, assignors to John Summers & Sons Limited, Shotton, Deeside, Flintshire, England

Filed Dec. 9, 1968, Ser. No. 782,259

Claims priority, application Great Britain, Dec. 14, 1967, 56,871/67

Int. Cl. B22f *7/04*

U.S. Cl. 117—22 13 Claims



A method of coating a moving metal surface comprising forming a dry layer of metallic powder on the surface, thereafter applying an aqueous liquid of a substance which gels when suitably hydrated to the said layer and allowing the water to penetrate the metallic powder layer, and then passing the metallic powder layer against a compression roller to compact the powder to the said surface, the said liquid acting to reduce the extent to which the roller dislodges the powder.

3,661,613

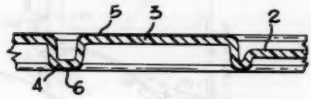
DECORATOR PANELS

Ralph G. Contrael, High Ridge; Leo G. Stahlhut, Kirkwood, and Richard E. Trippeer, Fenton, all of Mo., assignors to K-S-H Inc., St. Louis County, Mo.

Filed Nov. 21, 1968, Ser. No. 777,775

Int. Cl. B44c *5/04*

U.S. Cl. 117—37 R 1 Claim



A plastic panel having bas-relief forms on both sides from a reference level, defining thereby at least three general levels, at least two of which are painted and at least one of which is substantially free of paint. A planar plastic sheet is positioned against a mold having spaced high mold sections, spaced intermediate mold sections and valleys defined by said mold sections, and formed onto the mold sections and into the valleys to form the bas-relief relative to the intermediate mold sections. The panel is removed from the mold and painted on both sides on the raised surfaces of the bas-relief islands.

3,661,614

RADIATION-CURABLE INK COMPOSITIONS

Robert W. Bassemir, Jamaica, N.Y.; Daniel J. Carlick, Berkeley Heights, and Gerald I. Nass, West New York, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 685,331, Nov. 24, 1967, now abandoned. This application Dec. 11, 1969, Ser. No. 884,350. The portion of the term of the patent subsequent to Dec. 29, 1987, has been disclaimed.

Int. Cl. B05c *1/16*; C08d *1/00*; C08f *1/16*

U.S. Cl. 117—38 14 Claims

A radiation-curable solvent-free printing ink consists of (1) about 20 to 98 weight per cent of a pentaerythritol acrylate, methacrylate, or itaconate, (2) about 2 to 80 weight per cent of a halogenated aromatic, alicyclic, or aliphatic hydrocarbon photoinitiator wherein the halogen atoms are attached directly to the ring structure in the aromatic and alicyclic compounds and to the carbon chain in the aliphatic compounds, and (3) a colorant.

3,661,615

SUBSTRATE COATING PROCESS

Don N. Gray, Sylvania, Ohio, and John D. Grier, Okemos, Mich., assignors to Owens-Illinois, Inc.

Filed Mar. 11, 1969, Ser. No. 806,320

Int. Cl. C03c *17/10*

U.S. Cl. 117—46 CA 6 Claims

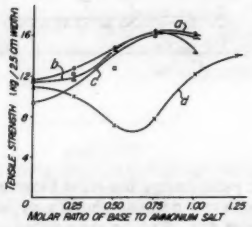
There is disclosed a process for coating a substrate which comprises applying to the substrate a polymeric based composition comprising a finely divided, particulate inorganic material dispersed in a low molecular weight, low vapor pressure, liquid polymer consisting of poly (alpha substituted) styrene and having a relatively constant viscosity and thixotropic character and capable of being decomposed or pyrolyzed completely to gaseous products at a relatively low temperature without forming a carbonaceous or like residue having a deleterious effect(s) in the application of the composition to the substrate.

3,661,616

PROCESS FOR CARBONIZING CELLULOSE FIBER OR THE PRODUCTS THEREOF

Kazuo Miyamichi, Koriyama-shi, Japan, assignor to Notto Boseki Co., Ltd., Fukushima-shi, Japan

Filed Oct. 24, 1969, Ser. No. 869,196
Claims priority, application Japan, Nov. 6, 1968, 43/81178; Sept. 5, 1969, 44/70437; 44/70438; Sept. 19, 1969, 44/74483
Int. Cl. C01b *31/07*
U.S. Cl. 117—46 CB 6 Claims



Cellulose fiber or the product thereof is treated with a strength increasing agent selected from the group consisting of (A) at least one compound selected from ammonium sulfite, ammonium bisulfite, ammonium bisulfate, or ammonium thiosulfate; (B) a mixture of at least one compound selected from ammonium sulfate, ammonium bisulfate, ammonium sulfite, ammonium bisulfite, ammonium thiosulfate, ammonium sulfate, or ammonium imidosulfonate with at least one organic nitrogen base; and (C) a mixture of an organic nitrogen base and an acid selected from sulfuric acid, sulfurous acid or sulfamic acid.

3,661,617

TREATMENT OF GLASS CLOTH

Irving Serlin, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 29, 1969, Ser. No. 795,046
Int. Cl. B22b *17/04;* C03c *25/02*
U.S. Cl. 117—54 7 Claims

Disclosed herein is a method for the treatment of aminosilane-sized hard drape glass cloth used in the preparation of resin impregnated composites which comprises treating the cloth with water prior to the fabrication of the composite. Polyimide resin impregnated laminates prepared from glass cloth treated with water in accordance with the present invention show a significant increase in the flexural strength after aging over laminates prepared from hard drape cloth which have not been treated with water.

3,661,618

PROCESS FOR THE PREPARATION OF PRESSURE SENSITIVE ADHESIVES

Robert S. Brookman; Stephen Grib, both of Pottstown, Pa., and Dale S. Pearson, Hauppauge, N.Y., assignors to The Firestone Fire and Rubber Co., Akron, Ohio

Filed June 30, 1969, Ser. No. 837,878
Int. Cl. C09j *7/02*
U.S. Cl. 117—62 7 Claims

Pressure sensitive adhesives are prepared from a monomer layer composition containing a liquid alkyl acrylate having an adjusted viscosity of about 100 centipoises or higher and optionally containing cross-linking monomers, by subjecting the monomer layer to high energy particle radiation in the essential absence of oxygen.

3,661,619

PRINTING PROCESS EMPLOYING MOISTURE

Aage Surland, Brooklyn, N.Y., assignor to Frye Industries Inc., New York, N.Y.

Filed Apr. 17, 1969, Ser. No. 817,163
Int. Cl. B44d *1/44;* B41m *7/00*
U.S. Cl. 117—62.2 9 Claims

A moisture setting printing process comprising the steps of printing with an ink having a vehicle comprising a glycolic soluble resin such as an acidic resin, a cross-linking agent such as hexamethylolmethyl melamine, a Lewis acid catalyst and a glycol solvent, contacting the printed ink with moisture and allowing a hardening reaction to proceed to completion.

3,661,620

METHOD OF ENCAPSULATING FILLERS WITH POLYMERS

Henri Dekking, Rootstown, and Edwin M. Maxey, Stow, both of Ohio, assignors to The General Tire & Rubber Company

Filed Nov. 26, 1969, Ser. No. 880,426
Int. Cl. C08k *1/82;* B44d *1/48;* C03c *17/32*
U.S. Cl. 117—62.2 2 Claims

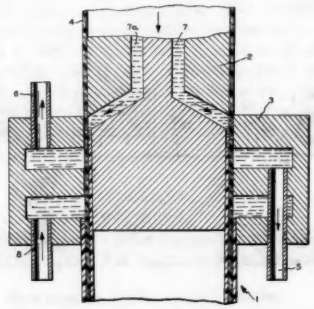
A method of rapidly polymerizing a thin coating of thermosetting monomer onto the surface of particulate matter such that the particles will not stick together and may thereafter be handled as a freely flowing material comprising wetting the material's surface with a solution containing a liquid polymerizable monomer and a free radical generating catalyst and then exposing the wet surface to an atmosphere containing sulfur dioxide to effect rapid polymerization.

3,661,621

PROCESS FOR PRODUCING TUBULAR STRUCTURES COATED ON BOTH SIDES

Eugen Jager, Bomlitz, Germany, assignor to Wolff & Co. Aktiengesellschaft, Walsrode, Germany

Filed June 4, 1969, Ser. No. 830,405
Claims priority, application Germany, June 8, 1968, P 17 71 564.9
Int. Cl. B05c *9/04;* B44d *1/40*
U.S. Cl. 117—68 3 Claims



Process for continuous production of inside and outside coated artificial tubular structures by first coating one side, thereafter applying vacuum from the other side to remove gases and impregnate the tube and then coating the second side and thereafter solidifing, washing and drying the tube, this process being carried out in a continuously working apparatus.

3,661,622

METHOD OF IMPROVING RESISTANCE TO CORROSION OF METAL SURFACES AND RESULTANT ARTICLE

Lynn C. Rogers, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 16, 1970, Ser. No. 20,038
Int. Cl. B44d *1/14*; B32b *15/04*
U.S. Cl. 117—75 23 Claims

A method of improving resistance to corrosion of metal surfaces is disclosed, wherein said method comprises:

a. applying to the metal surface a composition comprising (1) a major amount (e.g. at least 75 weight percent) of a thixotropic, grease-like composition consisting essentially of a non-volatile diluent, an oil-soluble dispersing agent and an alkaline earth metal carbonate and (2) a minor amount (e.g. 0.1 to 25 weight percent) of a polymer, and

b. applying to the coated metal surface a conventional paint. An important feature is the use of the composition described in step (a) as a primer coating.

3,661,623

HEAT STABLE POLYESTER CORD REINFORCED RUBBER STRUCTURE AND METHOD OF MAKING

Roop S. Bhakuni; John G. Morgan, and Terry F. Allen, all of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 3, 1969, Ser. No. 863,698
Int. Cl. B32b *25/02*, *27/36*
U.S. Cl. 117—76 T 13 Claims

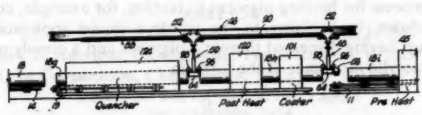
A method of making a heat stable polyester cord reinforced rubber structure, such as a tire, and the resultant structure, which method comprises applying an adhesive to the polyester cord and depositing in the vicinity of the adhesive a heat stabilizing agent selected from a tris substituted-aziridinyl phosphine oxide or sulfide, a polycarbodiimide, bis(tri-n-butyltin) oxide and a hindered phenol.

3,661,624

METHOD FOR COATING TUBULAR OBJECTS

Harry N. Versoy, New Orleans, and Robert J. Harris, Marrero, both of La., assignors to H. C. Price Co., Bartlesville, Okla.

Original application Dec. 11, 1967, Ser. No. 689,646, now Patent No. 3,581,922. Divided and this application July 21, 1970, Ser. No. 56,782
Int. Cl. B44d *1/094*, *1/08*
U.S. Cl. 117—94 5 Claims



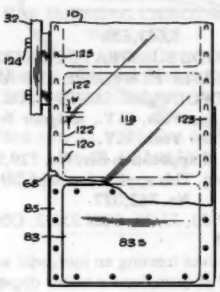
A relatively high speed, continuous method and novel apparatus, especially adapted to large diameter steel pipe, for applying external thin-mill coatings, such as thermal setting epoxy and epoxy resins, wherein the pipe sections are successively advanced in a train and continuously rotated through numerous operating stations, and embodying a change-over from an external roller drive line to an internal conveyor system. The pipe overhead suspension system permits even mill coating over the complete surface of the pipe and precludes damage to the coating during curing and while it is in the critical fluid state.

3,661,625

LABEL CARRYING STRIP FOR USE IN LABELING APPARATUS

Herbert La Mers, Los Angeles, Calif., assignor to La Mers Labeler Corporation, Santa Monica, Calif.

Filed Aug. 30, 1968, Ser. No. 756,651
Int. Cl. B32b *3/10*; G09b *3/02*
U.S. Cl. 161—109 6 Claims



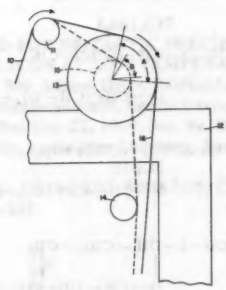
A label carrying strip for use in apparatus for applying labels to goods comprising an elongated web with labels spaced therealong and supported within the web.

3,661,626

METHOD OF COATING A FLEXIBLE WEB

Charles L. Wosaba, II, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 8, 1970, Ser. No. 35,783
Int. Cl. B05c *1/06*; C09d *3/44*; B05c *11/00*
U.S. Cl. 117—111 H 4 Claims



A method of applying a uniform coating of a soft, pliant material or the like, e.g. wax, on a continuous flexible web to coat a surface of the web with minute quantities of the pliant material. The coating is carried out by placing the web in surface contact with a coating roll made from the pliant material. The web is moved and the roll is turned such that there is a speed differential, i.e. slip, between the contacting surfaces of the roll and the web. The movement of the web over the peripheral surface of the roll in this manner uniformly coats the web with minute amounts of material transferred to the web from the roll surface.

3,661,627

HYDROPHILIC AND ANTISTATIC TREATMENT FOR POLYMERS

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 19, 1970, Ser. No. 38,875
Int. Cl. B44d 5/12
U.S. Cl. 117—118 5 Claims

A surface modification to impart antistatic and hydrophilic properties to polyurethanes or polyamides by reaction with acrylonitrile and a base.

3,661,628

INORGANIC OXIDE SUBSTRATE COATED WITH WATER DISPERSIBLE ETHYLENE AND ACRYLIC-METHACRYLIC COPOLYMER SALTS WITH SILOXANE

James G. Marsden, Amawalk, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 729,948, May 17, 1968, now abandoned. This application Sept. 29, 1969, Ser. No. 862,027
Int. Cl. C03c 17/03, 25/00; C08f 35/02; C09d 3/82
U.S. Cl. 117—126 GS 7 Claims

This invention involves treating an inorganic substrate with an organo-functional siloxane and a water dispersible salt of a copolymer of ethylene and acrylic and/or methacrylic acid. The invention is specifically characterized by the treatment of glass fiber as the substrate and the incorporation of the treated glass fiber in polyolefin molding resins for the purpose of making a reinforced composite.

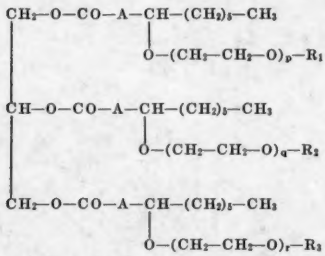
3,661,629

METHOD FOR THE PROCESSING OF SYNTHETIC FIBERS USED FOR REINFORCING RUBBER

Kyomi Honda, and Koji Misaki, both of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 19, 1970, Ser. No. 21,178
Claims priority, application Japan, Apr. 1, 1969, 44/25017
Int. Cl. D06m 15/26; B32b 27/06
U.S. Cl. 117—138.8 F 4 Claims

A method for the treatment of synthetic fibers used for reinforcing rubber, featuring treatment of the synthetic fiber used for reinforcing rubber with a treating agent in which a nonionic surface active agent (abbreviated as X below) with the following general formula:



where A represents $(CH_2)_7$-CH CH-CH_2 or $(CH_2)_{10}$; R_1, R_2 and R_3 represent hydrogen atoms or —CO—R′· —CO—R′· and —CO—R′; R′1, R′2 and R′3 represent aliphatic hydrocarbons with carbon numbers of 1 to 22; p, q, and r represent the molar numbers of the ethylene oxide added and $p+q+r$ is a positive integer = 50 to 300;
is combined with partially oxidized polyethylene with an average molecular weight of 500 to 10,000 (Abbreviated as Y below) in proportions within the limits of X = 5 to 40, Y = 0.1 to 3.0, and in which these components are combined with a lubricating agent and a surface active agent in addition to the aforesaid nonionic surface active agent X to give a total quantity of 100 weight percent

3,661,630

WELDABLE POLYURETHANE FOAM AND PROCESS FOR MANUFACTURE

Hans-Jurgen Remmert Kunststofftechniker, Wiesbaden, Germany, assignor to Firma Rudolph Koepp & Co., Chemische Fabrik AG

Filed July 10, 1969, Ser. No. 840,824
Claims priority, application Germany, July 19, 1969, P 17 69 819.0
Int. Cl. B32b 27/40; C08j 1/30
U.S. Cl. 117—138.8 D 16 Claims

Polyurethane foam of open pore structure is sized with a vinylidene chloride polymer to improve weladability thereof.

3,661,631

METHOD FOR IMPARTING WATER- AND OIL-REPELLENT PROPERTIES TO LEATHER AND LEATHER SO TREATED

Jurgen Plapper, Dusseldorf-Holthausen, and Friedrich Pieper, Langenfeld-Richrath, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf Holthausen, Germany

Filed June 18, 1970, Ser. No. 47,593
Claims priority, application Germany, June 27, 1969, P 19 32 630.8
Int. Cl. B44d 1/32; C14c 7/00
U.S. Cl. 117—142 16 Claims

A method for imparting water- and oil-repellent properties to leather is disclosed which uses as the treating composition a solution of

a. a condensation product formed by (1) an aluminum alcoholate of a lower monohydroxy alcohol having a carbon chain length of one to four carbon atoms with (2) a phosphoric acid monoester of a higher fatty alcohol having a carbon chain length of 12 to 20 carbon atoms, and

b. a fluorinated compound comprising lipophilic radicals having a carbon chain length of eight to 20 carbon atoms, selected from the group consisting of fluorocarboxylic acids and esters thereof, and fluoroalcohols and esters, ethers and acetals thereof in an inert organic solvent; the solution is applied to dry leather by immersion or spraying, as well as the water- and oil-repellent leather so produced.

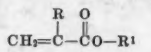
3,661,632

PROCESS FOR BINDING PIGMENTS TO TEXTILES

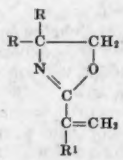
Domenick D. Gagliardi, East Greenwich, and Robert J. Cicione, Cranston, both of R.I., assignors to Commercial Solvents Corporation, New York, N.Y.

Filed June 17, 1968, Ser. No. 737,284
Int. Cl. C08j 1/36; D06m 1/00
U.S. Cl. 117—143 A 5 Claims

A process for binding pigment to textiles, for example, cotton fabrics, by applying to the textile a liquid application medium having dispersed therein a pigment and a copolymer of an acrylic monomer of the formula



wherein R is hydrogen or methyl and R^1 is hydrogen or an alkyl radical having from 1 up to about 6 carbon atoms and an oxazoline of the formula



wherein R is a lower alkyl radical having from 1 to about 3 carbon atoms, hydroxymethyl radical or the radical -CH_2-

OOC-R^1 and R^1 is an alkyl radical having from 1 to about 25 carbon atoms, the weight ratio of acrylic monomer to oxazoline in said copolymer being in the range of from about 75:25 to about 95:5, and drying the textile.

3,661,633

PROCESS AND COMPOSITION FOR IMPREGNATING WOOD AND WOOD PRODUCTS

Rolf Erhard Moren, Alfredshem, Sweden

Continuation-in-part of application Ser. No. 416,877, Dec. 8, 1964, now abandoned , and a continuation-in-part of 347,702, Feb. 27, 1964, now abandoned , and a continuation-in-part of 315,359, Oct. 10, 1963, now abandoned , and a continuation-in-part of 556,783, June 10, 1966, now Patent No. 3,406,038, and a continuation-in-part of 598,151, Dec. 1, 1966, now abandoned. This application Jan. 26, 1970, Ser. No. 6,037

Int. Cl. B27k *3/50*

U.S. Cl. 117—148 **2 Claims**

Wood impregnating compositions are provided comprising a polyoxyalkylene glycol having a molecular weight within the range from about 200 to about 5,000, which is sufficiently soluble in water to form at least a 30 percent solution, and at least one thermoplastic resinous or resin forming material compatible with the glycol and capable of retaining the glycol in the wood.

A method of improving dimensional stability of natural wood by applying to the wood such a wood-impregnating composition, and wood treated with such a composition, are also provided.

3,661,634

SEMIPERMEABLE OSMOTIC MEMBRANE AND METHOD OF PRODUCING SAME

Robert L. Riley, La Jolla, and Clifford R. Lyons, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Interior

Filed Oct. 31, 1969, Ser. No. 873,116

Int. Cl. C09d *3/72, 5/20*

U.S. Cl. 117—161 UA **6 Claims**

Semipermeable membranes prepared from a mixture of vinylpyrrolidone polymers and polyisocyantes. Process for preparing such membranes by casting the mixture from solution onto a smooth surface followed by curing under conditions of controlled humidity. Reaction of polyisocyanates with certain compounds having an active hydrogen atom provides a "blocked" polyisocyanate which does not react immediately with water at ambient temperatures thereby allowing greater processing control of membrane production.

3,661,635

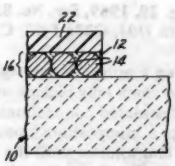
DUAL-ETCHED REFRACTORY METALLIZING

Henry F. Harrison, Chattanooga, Tenn., assignor to American Lava Corporation, Chattanooga, Tenn.

Filed Feb. 20, 1970, Ser. No. 13,025

Int. Cl. H05k *3/04*

U.S. Cl. 117—212 **5 Claims**



A process for metallizing on ceramic substrates with fine detail patterns of refractory metal which includes a prefiring to effect oxidation of a portion of the metallizing coating, application of a photopolymerizable coating thereover followed by exposure in pattern form using a mask, removal of unpolymerized coating by conventional means, acid etching to remove the oxides formed during pre-firing in exposed portions of the metallizing coating and mechanical removal of unoxidized and unsintered metal remaining in etched portions. This is followed by a final firing which destroys the photoresist and sinters the metal remaining on the substrate.

3,661,636

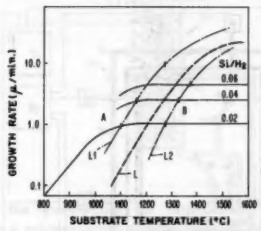
PROCESS FOR FORMING UNIFORM AND SMOOTH SURFACES

James M. Green, II, New York; Thomas O. Sedgwick, Crompond, and Victor J. Silvestri, Mount Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,789

Int. Cl. C23c *13/00*

U.S. Cl. 117—201 **14 Claims**



A method for forming uniform and smooth surfaces which can be used in any chemical vapor transport system and in general in any deposition system in which chemicals in a gas phase are reacted to cause deposition onto a substrate. A zone of operating conditions exists in which smooth uniform surfaces are obtained, while at the same time ridge growth and defect growth is minimized. By changing substrate temperature and the concentrations of input reactants, ridge growth and defect growth in deposited films are substantially reduced.

3,661,637

METHOD FOR EPITACTIC PRECIPITATION OF SILICON AT LOW TEMPERATURES

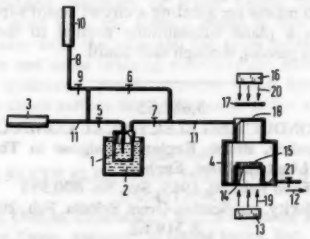
Erhard Sirtl, 809 Adams Drive, Midland, Mich., assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 22, 1969, Ser. No. 887,251

Claims priority, application Germany, Jan. 2, 1969, P 19 00 116.2

Int. Cl. C01b *33/02;* **H01l** *7/36;* **C23c** *11/00*

U.S. Cl. 117—201 **8 Claims**



A method for producing highly pure, monocrystalline silicon layers, with or without dopant additions, upon a wafer shaped substrate body, which comprises thermal dissociating

a gaseous silane compound, and by precipitating silicon upon a heated substrate body located in a reaction chamber. The crystalline structure of the silicon body is exposed e.g. by etching and its surface is flooded by the reaction gas. The silane compound is a dihalogen silane of formula SiH_2X_2, wherein X is chlorine, bromine, or iodine. The thermal dissociation is effected by heating the substrate body at low temperatures, preferably within a temperature range between 600° and 1,000° C.

3,661,638

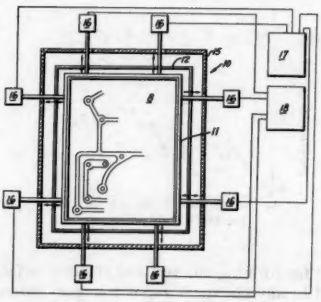
PROCESS FOR UNIFORMLY COATING PRINTED CIRCUIT BOARD THROUGH HOLES

Bogdan Lemecha, Dearborn, Mich., assignor to Photocircuits Corporation, Glen Cove, N.Y.

Filed May 26, 1970, Ser. No. 40,682

Int. Cl. B44d *1/18;* **B05c** *11/00, 11/10*

U.S. Cl. 117—212 **7 Claims**



A method and apparatus for leveling and controlling the thickness of conductive material on the walls of the through holes of a printed circuit board and for removing excess conductive material therefrom the steps comprising, immersing a printed circuit board having conductive material deposited in the through holes thereof into a heated bath of a heated conductive material, heating the conductive material in the through holes until said conductive material is in a molten state and, while said conductive material is molten, gyating said circuit board in said bath in a plane substantially normal to the axis of said through holes and thereby causing said molten conductive material to flow circumferentially and axially of said through holes to form a level and uniform coating of said conductive material on the walls of said through holes and cause any excess of said conductive material to flow out of said through holes onto the surfaces of said circuit board; said apparatus including a heated bath of heat conductive material, means for supporting at least one circuit board in said bath and means for gyrating a circuit board supported in said bath in a plane substantially normal to the axis of through holes passing through said board.

3,661,639

SUPERCONDUCTING ELECTRICAL CONDUCTORS

James S. Caslaw, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

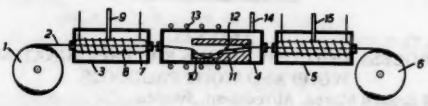
Filed Feb. 20, 1969, Ser. No. 800,951

Claims priority, application Great Britain, Feb. 20, 1968, 8,319/68

Int. Cl. B44d *1/18;* **C23b** *9/00;* **B44d** *1/34*

U.S. Cl. 117—213 **5 Claims**

In preparation of superconducting electrical conductors specifically niobium tin alloy, the reaction between niobium and tin is considerably accelerated if the niobium contains about 2,500 parts per million of oxygen before it is coated with tin. This concentration of oxygen does not have a harmful effect on the tape or its critical current density and the time for processing the tape may thus be considerably reduced.



3,661,640

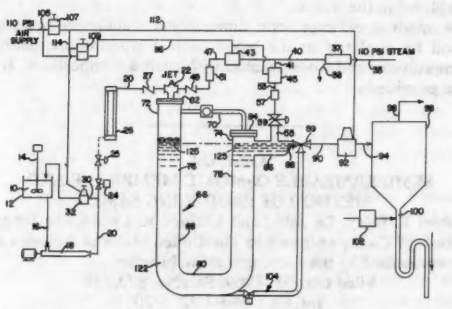
LOOP COOKER

Gene M. Griffith, and Lester P. Hayes, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 3, 1970, Ser. No. 25,372

Int. Cl. C13l *1/08*

U.S. Cl. 127—28 **9 Claims**



A continuous cooker having a continuous closed-loop cooking chamber which maintains a constant volume of liquid phase material and a constant volume of gas phase material therein. The cooker is provided with a liquid inlet on one side of the loop, and a common gas and liquid outlet on the other side of the loop. The loop is disposed to provide a lower passageway in which a constant volume of liquid resides, and an upper passageway in which a constant volume of pressurized gas resides. The cooker automatically maintains virtually constant retained-liquid volume regardless of discharge conditions. A gas, i.e., a material which is not condensed at operating conditions is continuously added to the upper passageway.

3,661,641

METHOD OF REMOVING POLYURETHANE RESIN PROTECTIVE COATING

Michael Walter Vigh, and Harold Thomas Rocheleau, both of Northridge, Calif.

Filed Aug. 29, 1969, Ser. No. 854,323

Int. Cl. B08b *7/04;* **C23g** *5/02;* **C11d** *7/50*

U.S. Cl. 134—6 **4 Claims**

Method of removing a polyurethane resin protective coating from an assembly which may include various types of circuit components and soldered connections, comprising treating the coating with a composition comprising methyl alcohol, ethyl alcohol and toluene until the resin softens sufficiently, and then stripping the softened resin from the assembly. The composition may also include a small proportion of propanol.

3,661,642

METHOD OF CLEANING BATTERY TERMINALS AND THE LIKE

Joseph Pisaturo, Providence, R.I., assignor to State Battery Co., Inc., Providence, R.I.

Filed Nov. 24, 1969, Ser. No. 879,599
Int. Cl. B08b *30/00*
U.S. Cl. 134—28 1 Claim

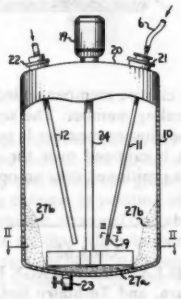
A method for cleaning corrosion off battery terminals and the like consisting of applying an aqueous solution having therein pure fruit dye, sucrose, sodium bicarbonate, benzoate of soda, and vitamin D^2 to the terminal and then flushing with water.

3,661,643

LEAD RING REMOVAL FROM A STEAM STILL

Irvin V. Lytton, Silsbee, and Ruel T. Rogers, Vidor, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 5,320, Jan. 23, 1970, now abandoned. This application Mar. 30, 1971, Ser. No. 129,441
Int. Cl. B08b *3/00*
U.S. Cl. 134—34 10 Claims



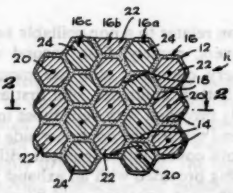
Lead ring deposits formed by the deposition of solid lead particles on steam still surfaces are removed by directing a fluid such as water, maintained at high pressure across an orifice at the surface to be cleaned. Pressures of 2,000 to 10,000 p.s.i.g. are employed across the orifice plate from which the fluid is directed against the surfaces to dislodge or explode the adherent lead ring from the still surfaces quickly and efficiently thereby eliminating the tedious mechanical scraping methods previously employed.

3,661,644

BATTERY CONSTRUCTION HAVING A HONEYCOMB MATRIX WITH CELLS FILLED WITH DIFFERENT ELECTRODE MATERIALS

Frank C. Arrance, Costa Mesa, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Dec. 19, 1966, Ser. No. 603,016
Int. Cl. H01n *35/04*
U.S. Cl. 136—6 12 Claims



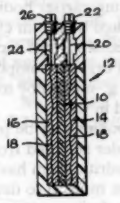
Electrode-separator unit, designed particularly for high energy density batteries, comprising an organic or inorganic honeycomb matrix, preferably formed of a porous ceramic material, a first electrode material such as zinc positioned in some of the cells of the honeycomb matrix and a second electrode material such as silver positioned in other cells of the honeycomb matrix, such electrode materials being separated by the honeycomb wall; and a battery containing such electrode-separator unit.

3,661,645

POLYTETRAFLUOROETHYLENE BATTERY SEPARATOR AND METHOD FOR PRODUCING SAME

Murray P. Strier, Niagara Falls, N.Y., and Joseph S. Smatko, Santa Barbara, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Continuation-in-part of application Ser. No. 6,409, Jan. 28, 1970. This application Apr. 13, 1970, Ser. No. 27,904
Int. Cl. H01m *3/02*
U.S. Cl. 136—20 19 Claims



Method for producing an improved battery separator, specifically a microporous polytetrafluoroethylene separator, having high ionic conductivity, and having a highly uniform porous structure, by mixing an aqueous dispersion of a substance which is insoluble in water and which does not precipitate or coagulate polytetrafluoroethylene from aqueous dispersion, e.g., zinc oxide, with an aqueous dispersion of polytetrafluoroethylene, casting a film of such mixture, drying the film, sintering the dried film, forming a polytetrafluoroethylene film with particles of such substance, e.g., zinc oxide, uniformly distributed in such film, and removing the particles of such substance from the polytetrafluoroethylene film, e.g., removing zinc oxide particles from the film by leaching with aqueous alkali. The resulting flexible film or separator produced by such process.

3,661,646

BATTERY PLATE BRIDGE SUPPORT

James H. Barrett, Jr., 3863 Surrey Road, Toledo, Ohio

Filed Aug. 10, 1970, Ser. No. 62,527
Int. Cl. H01m *1/04*
U.S. Cl. 136—79 9 Claims

A plurality of parallel bridge supporting rails for the lead plates of a storage battery for location in the bottom of the battery box, which rails are connected together by parallel cross bridging members of lesser height than the rails, whereby mud from the battery plates is free to settle and move under both the rails and the cross bridging members. The rails and cross bridging members are molded as a unit from a reinforced, plastic material which has smooth and rounded upper surface to which mud does not adhere.

3,661,647

SOLID STATE ELECTRIC CELL HAVING STABILIZED RESISTANCE

Boone B. Owens, Calabasas, Calif., and James R. Humphrey, Albany, Oreg., assignors to Gould Ionics, Inc.

Filed Aug. 31, 1970, Ser. No. 68,359
Int. Cl. H01m *11/00, 13/00*
U.S. Cl. 136—83 R 11 Claims

A solid state electric cell having a mobile oxidant such as iodine in the cathode, a solid state electrolyte and a suitable

anode containing a material which is capable of reducing the mobile oxidant. The electrolyte contains dispersed therein a material capable of reacting with the mobile oxidant preventing it from reaching the anode. For example, silver can be dispersed in the electrolyte of the cell containing mobile iodine in the cathode such that AgI will be formed dispersed throughout the electrolyte during storage.

3,661,648

PREPARATION OF CUPROUS CHLORIDE ELECTRODES

Gerard Marcel Gerbier, Biard, and Victor Louis Dechenaux, Poitiers, both of France, assignors to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme),, Romainville, France

Filed July 31, 1970, Ser. No. 60,154
Claims priority, application France, July 31, 1969, 6926329
Int. Cl. H01m *13/08*
U.S. Cl. 136—120 14 Claims

Electrodes for electrochemical cells are prepared from porous copper-containing carrier bodies by immersion at ambient temperature of such bodies in cupric chloride dissolved in an organic non-aqueous solvent such as methanol and subsequently washed in an organic compound capable of dissolving cupric chloride, e.g. methanol to remove excess cupric chloride and then dried in vacuo.

The porous carrier bodies may be prepared by sintering arborescent copper powder selected from the group consisting of acicular form or dendritic form having an apparent density of between 1 and 2 first molded to desired shape then heated to about 700° C. in a reducing atmosphere for about one half hour. A conductive copper or copper plated support of metal gauge or perforated metal sheet may be incorporated in the powder during molding.

In the alternative the copper carrier body can be molded from such copper powders agglomerated with an organic binder selected from the group consisting of polystyrene, polyethylene and polytetrafluoroethylene and this molded body immersed in cupric chloride dissolved in organic solvent such as methanol, with subsequent washing in organic compound such as methanol to remove excess cupric chloride and ultimate drying in vacuo.

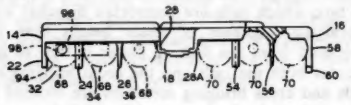
Electrodes and electrochemical cells utilizing said electrodes are also described.

3,661,649

BATTERY PACKAGE

Gordon E. Kaye, South Salem, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 22, 1970, Ser. No. 30,743
Int. Cl. H01m *1/02*
U.S. Cl. 136—132 3 Claims



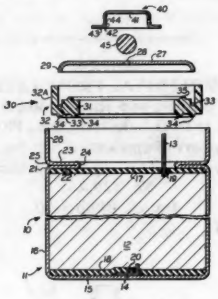
A battery package formed as a single plastic unit, with two side panels, each panel having pockets for accommodating a plurality of electro-chemical cells, and with a hingeing side edge panel joining the two side panels to permit folding the side panels toward each other, and means for holding them in a box structure, with integral end panels hinged at the ends of one side panel for folding to close the ends of the box, and means for holding the plastic box unit closed.

3,661,650

STORAGE BATTERY WITH CLOSURE SEAL AND VENT MEANS

John G. Flynn, New Bedford, Mass., assignor to High Energy Processing Corporation, New Bedford, Mass.

Filed Nov. 6, 1969, Ser. No. 874,576
Int. Cl. H01m *1/02, 1/06*
U.S. Cl. 136—133 2 Claims



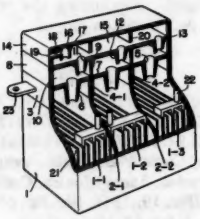
A battery with a closure member sealed in the casing by an annular resilient sealing member. The sealing member has a groove in which the closure member is positioned and an upstanding lip which is crimped over the closure member. A vent valve means is positioned over an opening in the closure member.

3,661,651

NON-SPILLABLE STORAGE BATTERY

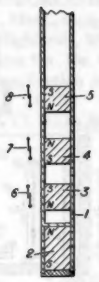
Motoharu Nishimura, and Toshihiro Isoi, Takatsuki, both of Japan, assignors to Yuasa Battery Company Limited, Osaka, Japan

Filed Apr. 22, 1970, Ser. No. 30,827
Claims priority, application Japan, Jan. 27, 1970, 45/7601
Int. Cl. H01m *1/02*
U.S. Cl. 136—170 3 Claims



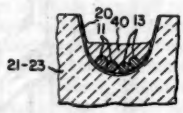
This invention relates to a non-spillable battery in which at least three covers, namely, first, second and third covers from the battery container side are mounted in multiple stages on one battery container, said first and second covers are respectively provided with vent tubes in the manner that the tubes depend toward the container side so as not to bring the tubes of both covers into alignment with each other, said third cover being provided with an exhaust passageway communicating with vent openings, said passageway being provided at one end with a small vent tube having a port to communicate with the atmosphere.

3,661,652
APPARATUS FOR INDICATING THE DENSITY OF A FLUID
Gerard Uitenbroek, Stockport, England, assignor to Oldham International Limited, Manchester, England
Filed Aug. 14, 1970, Ser. No. 63,860
Claims priority, application Great Britain, Aug. 18, 1969, 41,191/69
Int. Cl. H01m 45/06; G01n 9/00
U.S. Cl. 136—182 14 Claims



Density indicating apparatus comprises a guide member, a fixed magnet at one end of the guide member, a movable magnet movable up and down the guide member and a detector for detecting changes in position of the movable magnet. The two magnets are arranged one above the other so as to repel each other so that when immersed in a fluid, the second magnet takes up a position dependent on its weight, the magnetic forces acting on it and the buoyancy force due to displaced fluid.

3,661,653
THERMOELECTRIC APPARATUS
David L. Purdy, Indiana; Andrew C. Nyce, and Frederick Forscher, both of Pittsburgh, all of Pa., assignors to Arco Nuclear
Continuation of application Ser. No. 557,513, June 14, 1966, now abandoned. This application Mar. 21, 1969, Ser. No. 809,438
Int. Cl. H01v 1/02
U.S. Cl. 136—212 6 Claims

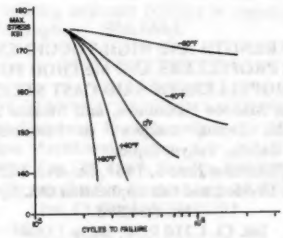


The thermoelectric tape disclosed is made up of thermoelectric wires as warp and thermally and electrically insulating thread as woof. The woof consists of threads of glass or quartz fibers except at the ends of the warp where cotton, which can be readily stripped, is used. The tape may include two layers, one having thermoelectric positive wires and the other negative wires, with the ends of the wires connected in unlike pairs to form junctions.

3,661,654
PROCESS FOR AUTOGENEOUS FLAME CUTTING
Gerhardt Lange, Frankfurt am Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany
Continuation-in-part of application Ser. No. 687,344, Dec. 1, 1967, now abandoned. This application Sept. 4, 1970, Ser. No. 69,974
Claims priority, application Germany, Dec. 7, 1966, P 15 52 944.9
Int. Cl. B23k 7/00
U.S. Cl. 148—9 12 Claims

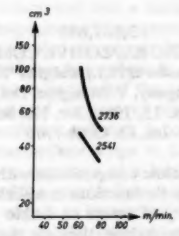
The flame cutting of seams to predetermined depths is characterized by reducing the cutting oxygen pressure more than 50 percent, and preferably 75 percent, of conventional cutting oxygen pressures. The cutting oxygen pressure is preferably 0.1 to 0.5 atmospheric excess pressure.

3,661,655
METALLIC ARTICLES AND THE MANUFACTURE THEREOF
Louis J. Hrusovsky, Bloomfield Hills, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 681,487, Nov. 8, 1967, now abandoned. This application Nov. 17, 1970, Ser. No. 90,342
Int. Cl. C21d 1/62, 9/02, 7/06
U.S. Cl. 148—12 10 Claims



The manufacture of articles from non-austenitic metallic materials by a technique in which the article is formed to essentially its final configuration; cooled; and, while cooled, worked to produce residual compressive stresses in one or more surface portions of the article.

3,661,656
CASE-HARDENED STEEL PRODUCT AND PROCESS FOR ITS MANUFACTURE
Martin Holger Jarleborg, Hedkarravagen, Sweden, assignor to Fagersta Bruks Aktiebolag, Fagersta, Sweden
Filed June 3, 1969, Ser. No. 829,949
Claims priority, application Sweden, June 14, 1968, 8093/68
Int. Cl. C21d 1/78
U.S. Cl. 148—12.1 12 Claims



The product comprises a tough core and at least one hard, carburized surface layer, the core containing 0.01–0.04% C,

2.2–6.0% Mn, 0.5–2.0% Si, up to 0.2% acid-soluble Al, 0.01–0.5% Nb and/or V, with Nb being replaceable by Ta, up to 0.03% N, up to 0.2% Zr, the balance being iron and impurities, the surface layer having a higher carbon content than the core but otherwise the same composition. The product is manufactured by shaping a blank of the aforesaid core composition, the shaping operation being followed by surface carburization and hardening.

3,661,657

METHOD FOR MAKING ALUMINUM SHEET

Winston A. Wong, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 7, 1970, Ser. No. 95,930
Int. Cl. C22f *1/04*; C22c *21/00*
U.S. Cl. 148—32 3 Claims

A method for forming aluminum sheet material containing 0.5–3.8 percent magnesium, having little or no propensity for forming ripples when subsequently plastically stretched during fabrication said method comprising hot rolling, intermediate annealing to effect substantially complete recrystallization and subsequently cold rolling to final gauge thickness and the product formed thereby.

3,661,658

HIGH-STRENGTH AND HIGH-TOUGHNESS CAST STEEL FOR PROPELLERS AND METHOD FOR MAKING PROPELLERS OF SAID CAST STEEL

Teishiro Oda; Makoto Nakamura, and Masato Zama, all of Nagasaki-shi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Original application June 5, 1967, Ser. No. 643,679, now abandoned. Divided and this application Oct. 8, 1969, Ser. No. 864,898
Int. Cl. C21d *9/50*; B23p *15/04*
U.S. Cl. 148—127 3 Claims

A method of making a high strength, high toughness cast steel marine propeller comprised of not more than 0.25 percent of carbon, not more than 1 percent of silicon, not more than 3 percent of manganese, from 5–20 percent of chromium, from 1–8 percent of cobalt, and from 0.5–7 percent of one or both of molybdenum and tungsten, and the remainder consisting of iron. In addition, the cast steel may contain up to 8 percent of nickel and up to 4 percent of copper, depending on the conditions. The method comprises casting the propeller into individual sections, welding said sections together, heating to a temperature of 800° to 1,000° C. and air cooling. The propeller can be aged by heating to a temperature between 450° and 700° C. If desired, the individual cast sections can be annealed prior to welding.

3,661,659

GELLED ACIDIC EXPLOSIVE COMPOSITIONS

Cyril J. Breza, Thorofare, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 13, 1969, Ser. No. 865,983
Int. Cl. C06b *7/00*
U.S. Cl. 149—19 9 Claims

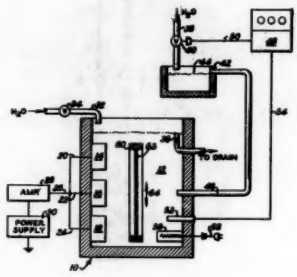
Gelling aqueous acidic compositions with a polymer having pendent amide or nitrile functions crosslinked by a monomer containing a plurality of amide or amine groups bonded to methylene or polymethylene through the amide or amine nitrogen, and a process for their preparation. The gelling system of this invention finds particular utility in explosive compositions based on an oxidizing agent and one or more fuels or sensitizers.

3,661,660

METHOD FOR ULTRASONIC ETCHING OF POLYMERIC PRINTING PLATES

Forrest A. Wessells, Baltimore, and Donald P. Gush, Hyattsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Original application Oct. 3, 1968, Ser. No. 764,849, which is a continuation-in-part of application Ser. No. 707,299, Feb. 21, 1968, now abandoned. Divided and this application Aug. 31, 1970, Ser. No. 68,257. The portion of the term of the patent subsequent to Oct. 4, 1987, has been disclaimed.
Int. Cl. B41n *3/02*; C23g *1/00*
U.S. Cl. 156—14 3 Claims



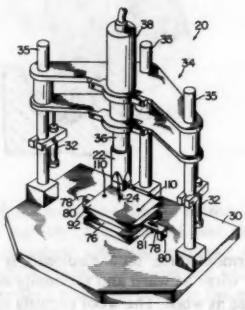
The invention disclosed is a method for ultrasonic etching of polymeric printing plates. The method includes an etching bath energized by means of ultrasonic energy, a water spray bath, and an air dryer. The method for ultrasonic etching of polymeric printing plates includes the steps of immersing a polymeric printing plate in an etching bath, energized by ultrasonic energy, washing the polymeric printing plate in a water spray cleaning bath after ultrasonic etching, and air drying the water washed polymeric printing plate in a current of heated air.

3,661,661

SONIC WELDING APPARATUS HAVING UNIVERSAL ALIGNING MEANS

Walter J. Berleyoung, Goshen, Ind., assignor to Robertshaw Controls Company, Richmond, Va.

Original application June 5, 1967, Ser. No. 643,716, now Patent No. 3,506,511. Divided and this application Dec. 9, 1969, Ser. No. 879,978
Int. Cl. B32b *31/16*; B29c *27/08*
U.S. Cl. 156—580 12 Claims



This application discloses an apparatus and method for sonically welding a plurality of thermoplastic relatively flat members or plates. A sonic signal producing element or horn

presses and imparts welding sonic signals to one of the flat members. A holding fixture holds one or more of such flat members. A base supports the holding fixture, and universal supporting joint means are provided between the holding fixture and the base. Such universal supporting joint means may include a relatively large spherical ball which is received in recesses in the holding fixture and in the base. This construction equally distributes the main part of the force of the horn over the entire surface of the parts to be welded together between the flat members or plates.

3,661,662

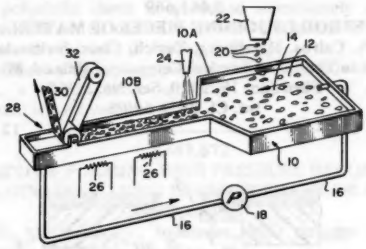
COMPOSITE MATERIALS WITH FLAKE REINFORCEMENT

Lloyd R. Allen, Belmont, Mass., assignor to National Research Corporation, Newton Highlands, Mass.

Continuation of application Ser. No. 630,725, Apr. 13, 1967, now abandoned. This application Apr. 16, 1970, Ser. No. 28,232

Int. Cl. B32b *5/16*

U.S. Cl. 156—62.2 **2 Claims**



Silicon carbide or boron carbide flakes are floated on a liquid bath, fixed into a sheet and formed into sheet laminates useful as high modulus structural composites. This assures a planar orientation and high packing factor of the reinforcing flake in the composite.

3,661,663

METHOD OF PRODUCING SILICEOUS FIBER CORROSION INHIBITING COMPOSITES

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Aug. 21, 1968, Ser. No. 754,496

Int. Cl. B29j *5/00*

U.S. Cl. 156—62.4 **7 Claims**

A method of producing siliceous fiber containing composites which inhibit chloride ion stress corrosion of stainless steel. The method comprises the production of a siliceous fiber batt, the fibers of which form the reinforcing structure of the insulation material, but which fibers will not of themselves inhibit the chloride ion stress corrosion. Alkali metal silicates having an alkali metal to silicate ratio of between 3.75 and 7.5 to 1, and which inhibit the corrosion, are bonded to the skeletal structure of the fibers with a porous binder to both rigidify the fibers and retain the corrosion inhibiting material. In the preferred method of producing the composite, the alkali metal silicate and binder are incorporated with the fibers during the forming process, and the binder is, thereafter hardened to simultaneously form the rigid composite and secure the alkaline metal silicate to the structural skeleton of the fibers. In a less preferred arrangement, the fibers are bonded together with an organic binder, which is then cured, and a slurry of inorganic cementitious material, incorporating the alkali metal silicate, is sucked into the bonded fiber skeleton and hardened to produce the composite.

3,661,664

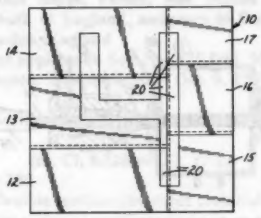
METHOD OF PRODUCING A SPLICED PICTORIAL

Raymond C. Lundell, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 11, 1969, Ser. No. 798,376

Int. Cl. B44c *1/00*

U.S. Cl. 156—63 **1 Claim**



Method of producing a spliced pictorial on transparent plastic film for application to large internally illuminated signs involving the steps of sectionalizing the pictorial, appropriately four-color printing each sectional while leaving a different two-color border on each of adjacent sectionals, and overlap splicing adjacent borders in registry to provide an inconspicious splice.

3,661,665

METHOD OF MANUFACTURING A COMPOSITE WEB

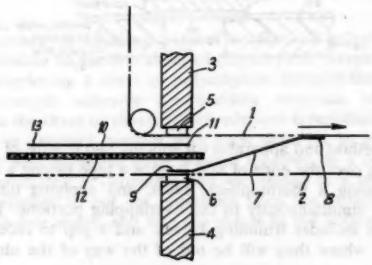
Pierre Froget, Nemours, France, assignor to "GRIESSER", Carros (Alpes Maritimes), France

Filed Aug. 20, 1969, Ser. No. 851,599

Claims priority, application France, Aug. 22, 1968, 163771

Int. Cl. E06b *9/26, 9/303*

U.S. Cl. 156—65 **1 Claim**



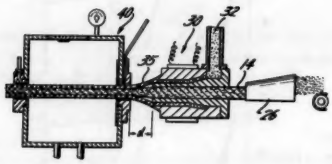
This invention is concerned with a method of continuously manufacturing a composite web comprising two flexibles superposed sheets assembled at spaced intervals by parallel flexible strips secured by their edges to the pair of superposed sheets so that a movement of the parallel strips can be obtained by moving said superposed sheets in relation to each other, this method consisting in causing the pair of sheets and their intermediate strips to be fed continuously between the pressure members of a heat-welding set while welding each edge of the intermediate strip only to the single sheet to which this edge is to be secured, an insulating sheet being interposed between the strip and the sheet to which this strip is not to be welded, for preventing the intermediate strip from being welded simultaneously to both sheets of the composite web without welding said insulating sheet to the elements between which it is inserted.

3,661,666

METHOD FOR MAKING SWAB APPLICATORS

Coleman Arthur Foster, and David Johnston Taylor, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,541
Int. Cl. B65b 7/00
U.S. Cl. 156—69 14 Claims



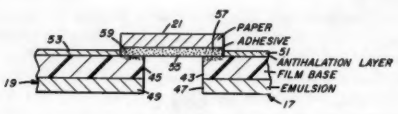
Swab applicators are made by extruding a plastic tube over a resilient mass of absorbent material. One end of the composite product is capped in such manner that when the cap is removed a portion of the absorbent material will be exposed to provide a swab tip. The applicator is then filled with a medicament or antiseptic fluid and the other end is sealed.

3,661,667

ULTRASONIC FILM SPLICING METHOD

Ray E. Gardner; William W. Voelckers, both of Rochester, and George T. Negus, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1968, Ser. No. 785,913
Int. Cl. B29c 27/08; B37b 31/18
U.S. Cl. 156—73 1 Claim



A method and apparatus for splicing two lengths of film by placing over the ends of said lengths a tape having a coating comprising a thermoplastic resin, and applying ultrasonic energy simultaneously to the overlapping portions. The apparatus includes trimming knives, and a gap to receive the knives where they will be out of the way of the ultrasonic horn.

3,661,668

METHOD OF MAKING A PNEUMATIC TIRE WITH REDUCED SUSCEPTIBILITY TO BLOW OR BLISTER DEFECTS

William C. Gallagher, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Original application Sept. 12, 1967, Ser. No. 667,244, now Patent No. 3,552,468. Divided and this application Apr. 1, 1970, Ser. No. 31,453
Int. Cl. B29h 17/28
U.S. Cl. 156—133 5 Claims

Pneumatic tires and like mold-cured cord reinforced elastomeric articles are rendered less susceptible to blow or blister defects by combining with the continuous filament strength cord auxiliary gas receiving voids provided by a small yarn of staple fiber thereby increasing the total voids volume and enabling contained air or gas to be safely retained within the tire or article.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

3,661,669

METHOD OF JOINING PIECES OF MATERIAL

James N. Cairns, Herrliberg, Zurich, Chur, Switzerland, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 19, 1970, Ser. No. 3,965
Int. Cl. B65h 69/02
U.S. Cl. 156—157 12 Claims

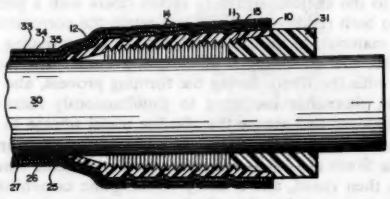
Pieces of material having a layer of foam adhered to one surface, for example, a foam-backed carpet, are joined by compressing permanently a narrow strip adjacent an edge of each piece of the material to be joined, butt-contacting those edges, joining together the two abutting edges to form a recessed portion and concurrently or subsequently inserting into the recessed portion and adhering thereto a strip of resilient foam having about the same thickness as the recessed portion so that the overall thickness of the foam where the pieces are joined is substantially the same as of other portions of the foam.

3,661,670

METHOD OF FORMING FIBER GLASS PIPE WITH INTEGRAL JOINT THREAD

William H. Pierpont, Jr., Wichita, Kans., assignor to Koch Industries, Inc., Wichita, Kans.

Original application Sept. 30, 1968, Ser. No. 763,564, now Patent No. 3,495,627. Divided and this application Sept. 15, 1969, Ser. No. 870,965
Int. Cl. B65h 81/00
U.S. Cl. 156—172 8 Claims



Glass reinforced plastic pipe having preformed threads integrally disposed therein formed by: (1) molding threaded

portions wherein the outer surface is preferably corrugated or irregular and which tapers down to the inside diameter of the pipe to which the thread is to be attached; (2) mounting said molded thread on the end of a mandrel; and (3) forming a pipe on said mandrel by providing pretensioned filamentous reinforcements longitudinally and helically disposed thereon and imbedded in a cured resin. The described tapered portion and corrugated portion of the thread is overwound with the above-mentioned helical and longitudinal filamentous material.

3,661,671

METHOD OF MANUFACTURING AN IMPROVED SIMULATED LEATHER AND THE LEATHER PRODUCT MANUFACTURED THEREFROM

Keizo Katagiri; Kenji Kuroishi; Kazuchika Nakamura, and Katsutoshi Hagiwara, all of Katsuta, Japan, assignors to Nippon Kakoh Seishi K.K., Tokyo, Japan

Filed Feb. 20, 1970, Ser. No. 13,207

Claims priority, application Japan, Feb. 21, 1969, 44/12513

Int. Cl. B32b *5/18*

U.S. Cl. 156—78 **7 Claims**

Method of manufacturing an improved simulated leather and the product leather are described. In the method, a low-foam polyolefin sheet is quenched immediately after its emergence from an extrusion die and the quenched side of said sheet is subjected to corona discharge.

An adhesive agent is applied to the treated side and, after drying, a thermoplastic synthetic resin film or sheet is laminated to said surface.

3,661,672

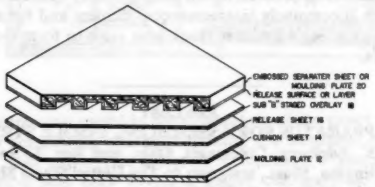
METHOD OF FORMING HIGH PRESSURE DECORATIVE LAMINATES HAVING REGISTERED COLOR AND EMBOSSING

John E. McQuade, Jr., Baltimore, Md., assignor to Esso Research and Engineering Company

Filed July 17, 1970, Ser. No. 62,780

Int. Cl. B44c *1/24;* **B44m** *1/24*

U.S. Cl. 156—220 **8 Claims**


EMBOSSED SEPARATER SHEET OR MOULDING PLATE 20
RELEASE SURFACE OR LAYER
SUB "B" STAGED OVERLAY 18
RELEASE SHEET 16
CUSHION SHEET 14
MOLDING PLATE 12

High pressure decorative laminates having registered color and embossing are provided by temporarily laminating a sheet impregnated with an incompletely B-staged melamine resin to an embossed plate and simultaneously embossing such sheet throughout its thickness, by then printing a design on the exposed surface of the now embossed sheet in registry with the embossing thereon, and using this temporary laminate in the production of a high pressure laminate whereby the melamine resin impregnated and color coated sheet is transferred from the embossed plate during lamination.

3,661,673

METHOD OF MAKING PLASTIC LAMINATE HAVING HIGH ABRASION RESISTANCE

John B. Merriam, Carpentersville, Ill., assignor to Woodall Industries Inc.

Filed May 1, 1969, Ser. No. 820,993

Int. Cl. B32b *31/00*

U.S. Cl. 156—279 **5 Claims**

A process for making a resin impregnated laminated sheet material and the resultant laminate produced therefrom which is provided with an abrasion-resistant surface layer comprising a cured resin incorporating a controlled quantity of substantially spherically shaped transparent glass beads of controlled size which are distributed substantially uniformly through the surface layer.

3,661,674

METHOD FOR THE MANUFACTURE OF FLEXIBLE SHEET MATERIALS

Maurice William Higgs, Pelsall, and Dennis Ivor Clarke, Erdington, both of England, assignors to Dunlop Holdings Limited, London, England

Continuation of application Ser. No. 625,002, Mar. 22, 1967, now abandoned. This application Oct. 9, 1970, Ser. No. 79,679

Claims priority, application Great Britain, Apr. 6, 1966, 15,413/66

Int. Cl. B32b *31/12, 31/26*

U.S. Cl. 156—280 **13 Claims**

To form a flexible leather-like sheet material a compressed sheet of cellular material is adhered to one or each surface of the resulting assembly, the binder is allowed to permeate and impregnate the assembly and the impregnated assembly is heated to set the binder. The term "fibrous material" is breadly defined in order to include also cellular non-fibrous materials.

3,661,675

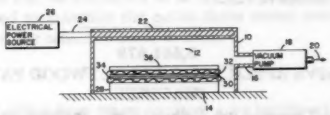
METHOD OF USING POLYETHYLENE TEREPHTHALATE AS A BONDING ADHESIVE

Jozef Frankowski, La Jolla, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Oct. 30, 1968, Ser. No. 771,902

Int. Cl. B29c *17/00*

U.S. Cl. 156—285 **3 Claims**



A method of bonding a sheet or film of polyethylene terephthalate to another sheet of polyethylene terephthalate or in employing a sheet of polyethylene terephthalate as a high strength adhesive for bonding materials together wherein the sheet or sheets of polyethylene terephthalate are placed in pressure contact with each other or in pressure contact with materials to be bonded together, in a continuously evacuated environment and are heated to a temperature sufficient to out gas impurities from the polyethylene terephthalate sheets and fuse the sheets to the adjacent surface.

3,661,676

PRODUCTION OF SINGLE CRYSTAL ALUMINUM OXIDE

Philip Wong, Boston, and Donald R. Messier, Marblehead, both of Mass., assignors to The United States of America as represented by the Secretary of the Army

Filed May 4, 1970, Ser. No. 34,290

Int. Cl. B29c *19/00*

U.S. Cl. 156—304 **3 Claims**

A method for the production of large single-crystals of Al_2O_3 comprising the positioning of several small single-crystals of Al_2O_3 on a substrate in a chamber, the catalytic oxidation of $AlCl_3$ in the presence of water vapor in the chamber and adjacent to the surfaces of the small single-crystals of Al_2O_3 to form Al_2O_3 and HCl gas. The produced Al_2O_3 being deposited on the surfaces of the small single crystals of Al_2O_3 to form a large single-crystal of Al_2O_3.

3,661,677

POST-HEAT TREATMENT FOR POLYVINYLIDENE CHLORIDE-COATED FILM

James C. Wang, Kendall Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 10, 1969, Ser. No. 865,335
Int. Cl. C09j 5/00
U.S. Cl. 156—315 2 Claims

In the preparation of a laminate of polyvinylidene chloride-coated nylon film with polyethylene film, the polyvinylidene chloride-coated nylon film is heated to at least about 110° F. for a period of time prior to applying adhesive for the lamination. This post-heat treatment of the coated nylon affords a laminate with very low retained solvent level without the need for lengthy storage. The product is suitable for packaging food products.

3,661,678

METHOD OF PREPARING A HEAT-SENSITIVE SHEET FOR USE IN STENCIL

Kubo Keishi, Kanagawa-ken; Sakai Kiyoshi, Tokyo, and Miyabe Shuichi, Chiba-ken, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed June 25, 1969, Ser. No. 836,286
Claims priority, application Japan, July 3, 1968, 43/45842
Int. Cl. C09j 5/00
U.S. Cl. 156—322 4 Claims

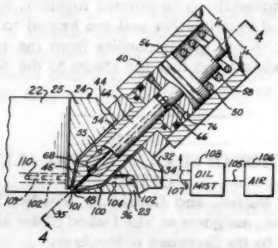
A method of preparing a heat-sensitive stencil sheet comprising the steps of; making a thermoplastic resin film consisting essentially of vinylidene chloride-vinyl chloride copolymer in contact with the surface of a heating roll having a surface temperature at 80°–110° C so as to heat the film and to move said film forward to the next step of processing, cooling said film immediately after it leaves the surface of the heating roll, and then laminating said film to a supporting sheet made of a thin sheet of porous paper by means of an interposed adhesive binder.

3,661,679

ADHESIVE APPLICATOR FOR PLYWOOD PATCHING MACHINE

Raymond Thomas Law, Salinas, Calif., assignor to Lockwood Technical, Inc., Sand City (Seaside), Calif.

Filed Sept. 8, 1970, Ser. No. 70,426
Int. Cl. B32b 35/00; B27f 4/00; B05b 1/08
U.S. Cl. 156—356 10 Claims



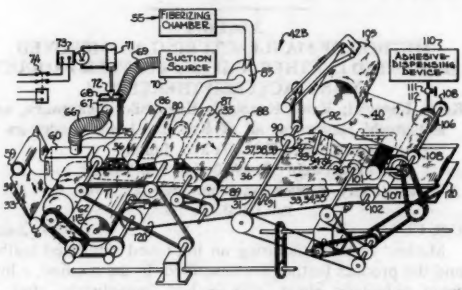
A conventional plywood patching machine is modified to permit accurately controlled application of adhesive directly to the interface between patch and ply. Nozzle applicators are built into the hold-down ring of a patching machine in a manner that requires minimum modification of other parts of the machine. A particularly effective nozzle and valve structure is described, responsive to pressure pulses and effectively compensating pressure and viscosity variations. A pulsed air jet spreads the adhesive. A release agent is applied via an airstream to prevent buildup of adhesive on the mechanism.

3,661,680

APPARATUS FOR SUCCESSIVELY FORMING DISPOSABLE DIAPERS

Graves T. Gore, Aiken, S.C., assignor to Riegel Textile Corporation, Ware Shoals, S.C.

Filed Mar. 9, 1970, Ser. No. 17,594
Int. Cl. B31f 7/00
U.S. Cl. 156—467 19 Claims



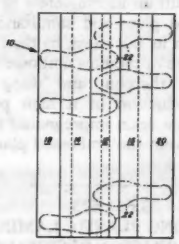
An apparatus for successively forming disposable diapers including means for supplying an elongate moisture absorbent pad and for feeding it along a predetermined longitudinal path of travel, means for supplying and positioning an elongate fluid permeable front cover sheet in superimposed relation to one side of the pad and means for supplying and positioning an elongate backing sheet in superimposed relation to the other side of the pad. Means are provided for receiving and feeding the superimposed front cover sheet, pad and backing sheet along a predetermined longitudinal path of travel, while additional means cooperate therewith for longitudinally sealing the side portions of the superimposed components, for transversely sealing the superimposed components at predetermined longitudinally spaced intervals to form successively interconnected diapers and for severing the same along successive transverse seals to form individual diapers.

3,661,681

APPARATUS FOR ASSEMBLING INSOLE STRIPS

Alan K. Edelberg, Cincinnati, Ohio, and Roy T. Swanfeldt, Burlington, Mass., assignors to The United States Shoe Corporation, Cincinnati, Ohio

Filed Sept. 18, 1969, Ser. No. 859,143
Int. Cl. B32b 31/12, 31/20
U.S. Cl. 156—546 41 Claims



A machine for assembling diverse strip materials into a composite edge-laminated sheet from which insoles for shoes can be cut is disclosed. Stacks of insole strip materials are arranged on aligned, side by side loading platforms in a feeder portion of the machine. Adjacent edges of contiguous strips may be beveled to permit edge bonding by the machine into

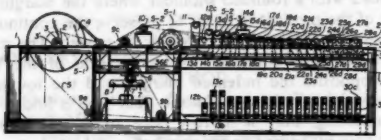
a single, composite, flat sheet. A vacuum device in the feeder portion picks up the top strips from each stack and delivers them to corresponding parallel endless belts. The strip from the centrally located loading platform and the strips from the two adjacent platforms are delivered to a first adhesive station where a hot melt adhesive is applied to the edges of the central strip or the corresponding inside edges of the outer strips. After passing the adhesive section, the strips are delivered to an assembly station where the two adjacent strips are moved laterally into alignment with the edges of the central strip. The three strips are then bonded together by being passed through suitable nip and pressure rolls. The resultant intermediate sheet is passed through a second adhesive section, where adhesive is applied to the outer edges, or the corresponding inside edges of the remaining strips, and then passes to a second assembly section. The remaining outer strips are then aligned with the edges of the intermediate sheet for joining by passing through a second set of nip and pressure rolls. The finished composite sheet is then delivered to a stacking station and subsequently may be cut into individual insoles of the desired size and composition.

3,661,682

APPARATUS FOR FABRICATING CYLINDRICAL TUBES FOR RAISING AND TRANSPLANTING SEEDLINGS OF FARM CROPS

Yoshio Shoji; Toshiaki Kobayashi, and Tadao Kudo, all of Hokkaido, Japan, assignors to Nippon Tensai Seito Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1969, Ser. No. 883,454
Claims priority, application Japan, July 23, 1969, 44/58573
Int. Cl. B32b *31/08*
U.S. Cl. 156—548 **7 Claims**



An apparatus useful in the production of the paper pot assembly for raising and transplanting the seedlings of farm crops, said paper pot assembly comprising a plurality of cylindrical pots each having a square configuration in section. The apparatus comprises means for applying equidistantly spaced parallel lines or a wide strip of adhesive to one-half the width of one side of each flattened tube, tape-gathering means for converging a plurality of the flattened tubes thus applied with the adhesive to superpose consecutively the flattened tubes on one another in such a manner that two adjacent flattened tubes are disposed in a transversely staggered relation to one another with adjacent tubes overlapping by one-half their width. A combined regulating and guide means controls the travel of the flattened tubes and guides them into pressure rollers where the flattened tubes are adhered together while correctly keeping the staggered or overlapped relation.

3,661,683

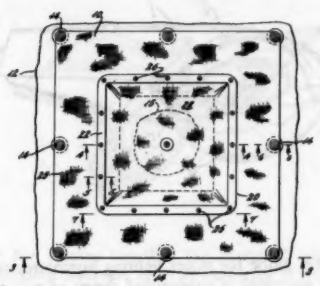
PATCH PRESS

Harry C. Engel, and Edward J. Ardolino, both of Harve de Grace, Md., assignors to Airline Systems, Inc., Harve de Grace, Md.

Filed Nov. 3, 1970, Ser. No. 86,437
Int. Cl. B30b *9/22*; B29b *19/00*
U.S. Cl. 156—580 **10 Claims**

The present invention relates to a patch press, particularly but not exclusively adapted to use in repairing airplane surfaces by adhesively patching a double plate over the damaged area.

The patch press itself involves a longitudinally split rectangular frame that has clamped therein a cover member which may be heavy duty fabric such as canvas that extends across the framed area and beyond and which serves to carry a plurality of suction cups at the periphery thereof so that the press may be mounted on and adhered to the undamaged surface around the region to be patched with the patch inside the frame. Sealed inside the frame and secured thereto is an



inflatable, suitably valved diaphragm into which air or other gas can be pumped. That portion of the cover member inside the framed area acts as an outside reinforcement for the inflatable diaphragm, so that the forces generated when inflatable diaphragm is inflated and beats against the patch are transmitted directly to the suction cups.

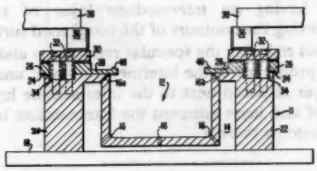
The patch press is a portable, essentially self-contained unit which can be employed to hold a patch onto an airplane surface and to maintain the patch there under pressure long enough for the adhesive bond to cure.

3,661,684

APPARATUS FOR PRODUCING A PADDED ARTICLE

John Rallis, Marion, Ind., and James C. Dillon, Santa Ana, Calif., assignors to The General Tire and Rubber Company

Continuation of application Ser. No. 673,343, Oct. 6, 1967, now Patent No. 3,587,284. This application July 15, 1979, Ser. No. 61,524
Int. Cl. B30b *15/34*; B32b *31/20*; B29c *27/06*
U.S. Cl. 156—583 **5 Claims**



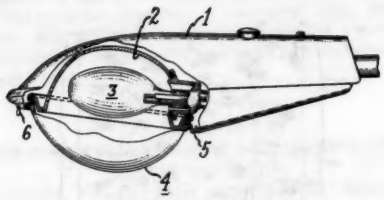
The hereinafter specification discloses an apparatus for forming, filling and closing a padded article. The article is provided with a hidden seam and is suitable for use as a cushion, chair seat, chair back, automobile crash pad, or the like. According to the invention, a cover sheet of plastic material is plug formed into a die cavity such that a pocket is created in the sheet. The pocket is filled with a foam padding and a rigid support member. A plastic cap sheet is applied and head sealed to the cover sheet using sliding seal bars to hide the seam and to close the article.

3,661,685

LAMINATED ASSEMBLY OF POLYCARBONATE AND POLYACRYLATE RESIN SHEETS AND METHOD OF MAKING THE SAME

Mitchell M. Osteen, Zirconia, N.C., assignor to General Electric Company

Filed Oct. 28, 1968, Ser. No. 771,107
Int. Cl. H01k 5/00; B32b 27/30
U.S. Cl. 161—1 11 Claims



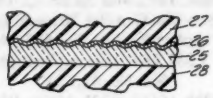
Transparent globe for street lighting luminaires comprises a laminated assembly of superposed sheets of polycarbonate resin and polyacrylate resin having an ultraviolet absorbing compound incorporated preferably in the polyacrylate resin sheet.

3,661,686

TRANSPARENT LAMINATED STRUCTURE OF REDUCED SPECULAR REFLECTANCE

Ramsey C. Armstrong, Pacific Palisades, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Filed Apr. 27, 1967, Ser. No. 634,297
Int. Cl. G02b 1/10, 5/26
U.S. Cl. 161—2 14 Claims



A laminated structure, transparent or adapted to be made transparent, having an intermediate layer of reflective material following the contours of the roughened surface of a first layer, thus reducing the specular reflectance and mirror-like imaging properties of the intermediate layer, and a thermoplastic layer disposed next to the intermediate layer with the surface of said layer adjacent the intermediate layer following the contours thereof.

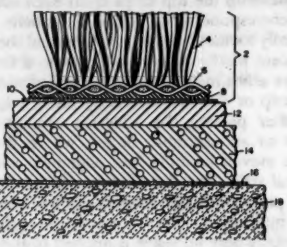
3,661,687

ARTIFICIAL GRASS SPORTS FIELD

Arthur F. Spinney, Jr., Saugus, and Lawrence J. Warnalis, West Medford, both of Mass., assignors to American Biltrite Rubber Co., Inc., Chelsea, Mass.

Filed Apr. 29, 1970, Ser. No. 32,986
Int. Cl. A63c 19/04; E01c 13/00
U.S. Cl. 161—21 7 Claims

The invention is a composite sports field in which the top surface is artificial grass, the next layer (down) is a layer of shock dissipating material, the next layer is a shock-absorbing material, and the bottom layer is a foundation which preferably is an asphalt composition suitably crowned to effect proper drainage.

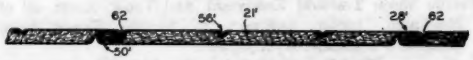


3,661,688

COMPOSITE BOARD LAMINATE

Robert G. Wheeler, Corvallis, Oreg., assignor to Wood Process, Oregon Ltd., Corvallis, Oreg.

Filed Feb. 18, 1970, Ser. No. 12,356
Int. Cl. B32b 3/02, 3/30
U.S. Cl. 161—37 9 Claims



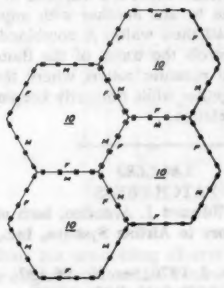
A composite board product according to the present invention is formed from a core of coarse wood components disposed between a pair of cellulosic fiber webs. This assembly is compressed to consolidate the board product and to provide an indented margin thereupon. The board product is provided with a rounded shoulder where the margin joins the rest of the product in order to preserve the continuity of the tough skin formed by a cellulosic fiber web. The margin edge is preferably rounded off on the side of the board product opposite the indented margin, and the tough skin formed by the remaining cellulosic fiber web is folded over. After trimming, only a narrow edge of doubly densified wooden core is exposed to the weather.

3,661,689

ASSEMBLED CAMOUFLAGE MATERIAL OF INTERLOCKED SEPARATE UNITS

Joseph A. Spanier, 245 South Van Ness Ave., San Francisco, Calif.

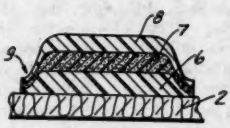
Filed Sept. 23, 1968, Ser. No. 761,690
Int. Cl. B32b 3/10
U.S. Cl. 161—37 4 Claims



Flexible material in sheet form suitably decorated for military camouflage purposes provided in separate units or

modules of hexagonal configuration with male and female fastening devices arranged in alternate groups which are co-extensive with sides of the hexagon to facilitate ready connection of a plurality of modules with the edges of each connected to edge of others to provide a large, continuous sheet having camouflage characteristics.

3,661,690
FLOATABLE WASHCLOTH
Michael A. Taranto, 93 Van Horn St., Demerest, N.J.
Filed May 11, 1970, Ser. No. 36,088
Int. Cl. B32b *3/02;* **A47k** *7/02*
U.S. Cl. 161—39 **7 Claims**



A layer of terry material has superimposed upon one side thereof a layer of fluid-impermeable synthetic plastic sheet material covering at least a portion of this one side. A layer of resiliently compressible spacing material is superimposed upon the sheet material and an additional layer of fluid-impermeable synthetic plastic sheet material is superimposed upon the spacing material and is adhered across the intervening layers to the terry cloth along at least one circumferentially complete annular zone inwardly of the edges of the layer of spacing material and the layers of synthetic plastic material, so that the terry cloth is provided with a three-dimensional resilient applique which constitutes at least within the confines of the aforementioned zone a flotation aid for the washcloth so that the same will float in liquid.

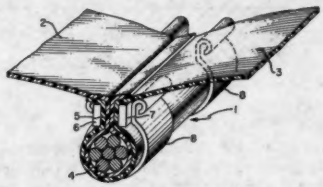
3,661,691
FLAME-RETARDANT VINYL FOAM CARPET AND METHOD
David K. Slosberg, Atlanta, Ga., assignor to Pandel-Bradford, Inc., Lowell, Mass.
Filed Dec. 28, 1970, Ser. No. 101,552
Int. Cl. D05c *17/00;* **B29c** *27/00;* **C09j** *5/00*
U.S. Cl. 161—67 **22 Claims**

A flame-retardant vinyl resin-backed surface covering; e.g., tufted carpet, which carpet is characterized by enhanced flame resistance and reduced flammability-rate characteristics in that the vinyl backing is securely bonded to the tufted base and the thermoplastic primary backing is inhibited from shrinking and cracking under conditions of open-flame ignition. A vinyl foam-backed tufted carpet is prepared by applying a carboxylated cross-linkable vinyl chloride resin composition to the back surface of a thermoplastic backing sheet containing a pile face surface of tufted yarns; heating the plastisol composition to cross-link the vinyl chloride resin and to bond the tufted yarns to the thermoplastic base fabric while maintaining the temperature below the shrinkable temperature of the base fabric; and laminating the foam vinyl backing to the surface of the cross-linked vinyl chloride resin composition.

3,661,692
COATED FABRICS
Charles N. Berczi, Ormskirk, England, assignor to Deering Milliken Research Corporation, Spartanberg, S.C.
Filed Nov. 25, 1968, Ser. No. 816,849
Claims priority, application Great Britain, Nov. 25, 1968, 53,619/67; 53,620/67
Int. Cl. D03d *15/00;* **B32b** *27/02*
U.S. Cl. 161—89 **18 Claims**

multi-ply An elastomer coated, open weave, square woven fabric of milti-ply cords including continuous filament, organic, synthetic fibers, in which both the cords and their component plies have a twist in the range of 3 ½ to 45 turns per inch.

3,661,693
REINFORCED SEAM FOR SHEET MATERIAL
Robert M. Pierson, Hudson, Ohio, assignor to Environmental Structures, Inc., Cleveland, Ohio
Filed Aug. 18, 1969, Ser. No. 850,826
Int. Cl. B32b *7/08, 3/06, 3/04*
U.S. Cl. 161—101 **6 Claims**

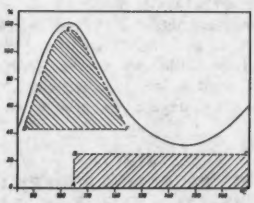


A seam for joining together the marginal edges of two sheets of flexible material, such as plastic or fabric, in which the edges are wrapped around a cable or other reinforcing member and clamped in the wrapped position to provide a leak-proof seam without the use of adhesives, sewing, heat sealing or other conventional fastening means. The sheets may, as an alternative, be wrapped around a filler member, then clamped to a reinforcing member. This seam is useful on inflatable buildings and other similar structures.

ERRATUM

For Class 161—109 see:
Patent No. 3,661,625

3,661,694
BIDIRECTIONALLY ORIENTED CORRUGATED PLATES
Jean Francois Bequet, Brussels; Roger Van Asbroeck, Neerijse, and Paul Du Bois, Braine-lAlleund, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium
Filed Dec. 30, 1970, Ser. No. 102,607
Claims priority, application Belgium, Dec. 31, 1969, 83421
Int. Cl. B32b *3/28, 3/30*
U.S. Cl. 161—133 **8 Claims**



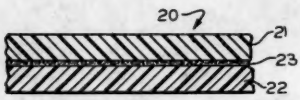
Corrugated plates are made of polyvinyl chloride resin, and are bidirectionally oriented in such a manner that an element which is sampled therefrom presents a retraction of at least 30 percent along the two main axes of the plates after a residence of 8 hours in an oven kept at 140° C. The plates have a resiliency in tension at 20° C in excess of 650 cm kgf/cm² and a resiliency in prestressed condition in excess of 300 kfg/cm². They are resistant at 4° C to impacts caused by boxwood balls of 200 mm diameter which are projected perpendicularly against the surface of said plates at a speed such that their kinetic energy is 0.105 m kgf.

3,661,695

TWO WATER SOLUBLE FILMS CONNECTED TO EACH SIDE OF A WATER IMPERVIOUS SYNTHETIC MEMBRANE

Julius F. T. Berliner, Chicago, Ill., assignor to M. D. Industries, Inc., Chicago, Ill.

Filed May 19, 1970, Ser. No. 38,777
Int. Cl. B32b *5/10, 7/10, 23/08*
U.S. Cl. 161—151 14 Claims



Two sheets of water soluble film are cemented together with a waterproof adhesive which forms a thin membrane. If either side of the laminated film is exposed to water, that side is dissolved quickly, but the membrane prevents the other side from becoming wet. The other water soluble side provides a mechanical strength, adequate to support the weight of water or other substances resting on the membrane. When the laminate is discarded into a water substance, the other side dissolves leaving only the membrane which is too weak to survive as a mechanical structure.

3,661,696

ETHYLENE-VINYL ACETATE COPOLYMER ADHESIVE COMPOSITION AND METHOD OF PREPARATION

Gaylen M. Knutson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 30, 1970, Ser. No. 77,018
Int. Cl. C08f *15/02, 37/18, 1/13*
U.S. Cl. 161—204 16 Claims

A process for the production of an aqueous emulsion of an ethylene-vinyl acetate copolymer is disclosed wherein the polymerization is performed in the presence of a preformed seed emulsion and a minor amount, from 1.5 to 6 weight percent, of a protective colloid comprising a mixture of fully and partially hydrolyzed polyvinyl acetate. The seed emulsion is comprised of from 25 to 63 weight percent of ethylene-vinyl acetate copolymers which contain from 1 to 20 weight percent ethylene and from 1 to 5 weight percent of a partially hydrolyzed polyvinyl acetate. The polymerization is performed under an ethylene pressure of from 100 to 1,000 psig., sufficient to incorporate from 1 to 20 weight percent ethylene in the final copolymer product and carried out until the total free monomer content of the emulsion is maintained below about 1 weight percent. Conventional free radical initiation of the polymerization reaction is used. The resultant emulsion can be used as an adhesive since films formed therefrom exhibit a high degree of adhesiveness.

3,661,697

MULTI-PLY PACKAGING MATERIAL OF POLYETHYLENE, AMYLOSE AND PAPER

Ellsworth E. Kimmel, and Austin H. Young, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of application Ser. No. 378,984, June 29, 1964, now abandoned. This application Jan. 2, 1969, Ser. No. 791,860
Int. Cl. B22b *9/06;* B32b *27/10;* C08h *17/26*
U.S. Cl. 161—250 5 Claims

A water-resistant, grease-resistant, oxygen-resistant multiply structure comprising, bonded together, smooth continuous layers of polyolefine and amylose, and paper bonded to either the polyolefine or amylose layer.

3,661,698

PRODUCTION OF PULP BY A MULTI-STAGE AMMONIUM POLYSULPHIDE PULPING PROCESS

David W. Clayton, Hudson, Quebec, and Asahi Sakai, St. Laurent, Quebec, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed Oct. 8, 1969, Ser. No. 864,740
Int. Cl. D21c *3/26*
U.S. Cl. 162—19 8 Claims

In a process for the production of cellulosic pulp from lignocellulosic material which comprises impregnating said material in subdivided form with a polysulphide liquor containing ammonium hydroxide in an amount sufficient to maintain a pH of at least 11.5 and at a temperature below that at which substantial decomposition of the polysulphide occurs, removing excess polysulphide from the material, heating the polysulphide impregnated material in the presence of ammonia gas to stabilize the material, and subsequently cooking the material with sodium hydroxide containing cooking liquor to delignify the material.

3,661,699

BLEACHING OF LIGNIN-CONTAINING CELLULOSE MATERIALS SUCH AS PULP

Charles Edward Farley, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 24,363, Mar. 31, 1970, now abandoned. This application Dec. 21, 1970, Ser. No. 100,474
Int. Cl. D21c
U.S. Cl. 162—65 4 Claims

Digester pulp is brightened and delignified by contacting the pulp with an aqueous medium containing oxygen and trisodium phosphate. The oxygen liberates the lignin substituents and the trisodium phosphate carries the lignin substituents into solution while minimizing degradation of the polymeric structure of the cellulose.

3,661,700

COATED REINFORCED PAPER AND PROCESS FOR PREPARING SAME

Gianfranco Zilio, Milan, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy

Filed Mar. 18, 1970, Ser. No. 20,846
Claims priority, application Italy, Mar. 20, 1969, 14323 A/69
Int. Cl. B32b *5/20;* D21d *3/00*
U.S. Cl. 162—103 8 Claims

Coated reinforced papers having excellent mechanical and other characteristics are obtained by coating a net-like support obtained from a longitudinally oriented film of polypropylene consisting essentially of isotactic polypropylene with a composition formed of cellulosic or other fibers, mineral and/or organic fillers and/or pigments, and binders.

3,661,701

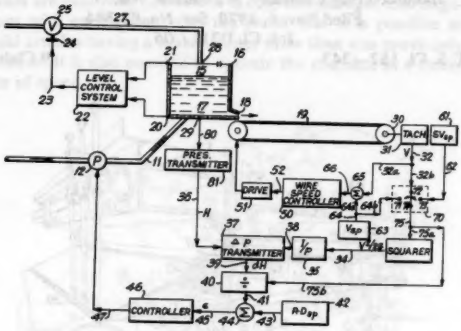
METHOD AND APPARATUS FOR CONTROLLING RUSH-DRAG IN A PAPER MACHINE

Abdul-Rahman A. Al-Shaikh, Mount Kisco, N.Y., assignor to Westvaco Corporation, New York, N.Y.

Filed June 23, 1970, Ser. No. 49,067
Int. Cl. D21f *1/06*
U.S. Cl. 162—198 9 Claims

A system for controlling the difference between the velocity of a pulp slurry discharging from a paper machine headbox and the speed of the fourdrinier wire onto which said pump slurry is deposited. The system includes means for deriving a signal representative of the aforementioned speed differential thus allowing a direct comparison between the actual velocity differential and the desired velocity differential. The control system is based upon a differentiated

and rearranged form of the equation $v^2=2gh$ which is $dv=(g/v)dh$, wherein dv = the rush or drag in units of speed, v = the wire speed, g = the gravitational constant, and dh = the differential head, i.e., that part of the total head which gives rise to the velocity difference between the slice velocity and the wire speed, in units of inches of H_20.



3,661,702
STOCK FLOW SYSTEM FOR PAPER-MAKING MACHINE

John A. Means, Norwalk, Conn., assignor to Time, Incorporated, New York, N.Y.

Filed Dec. 15, 1969, Ser. No. 884,844
Int. Cl. D21f 1/06
U.S. Cl. 162—216 **10 Claims**

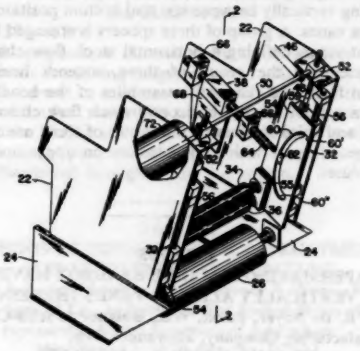
In order to establish diffusion among a plurality of fluid streams emanating respectively from a plurality of conduits in parallel, closely-spaced-apart relation, the streams are combined within a single enclosure to form a single stream of substantial width compared to its thickness. The enclosure is formed with a double elbow so that the direction of movement of the stream is changed twice in succession, through an angle of substantially 90° in each case. The enclosure is formed in the vicinity of each elbow in such a manner as to cause acceleration of the stock during each change in its direction of movement and deceleration of the stock immediately preceding each change in its direction of movement.

3,661,703
DECURLING APPARATUS

Clifford D. Shelor, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,588
Int. Cl. D21f 7/02
U.S. Cl. 162—271 **10 Claims**

Decurling apparatus for controlling the curl characteristics of a web incorporates a pair of elongated decurling rollers over a selected one of which the web may be drawn to produce a modification of its curl tendency. The magnitude of the curl tendency modification produced in the web is a function of the sharpness of the angle at which the web is drawn over the selected decurling roller. To vary the magnitude of the curl tendency modification being produced, the position of the selected decurling roller with respect to the web is varied to change the sharpness of the angular path of the web over the decurling roller.

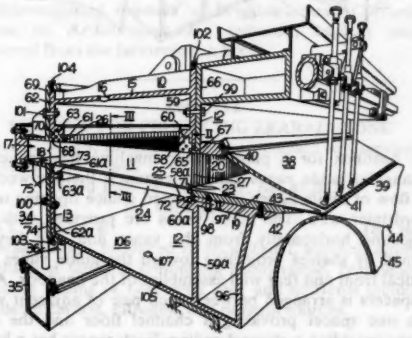


A movably mounted compensating roller over which the web is drawn is repositioned in response to movement of the selected decurling roller to compensate for the tendency of decurling roller movement to change the overall web path length.

3,661,704
AIR LOADED PAPERMAKING MACHINE HEADBOX WITH STOCK OVERFLOW CHANNELS AND VERTICALLY ALIGNED VANES THEREIN

Donald B. DeNoyer, Beloit, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 6, 1970, Ser. No. 87,381
Int. Cl. D21f 1/06
U.S. Cl. 162—337 **12 Claims**



An air loaded headbox for a papermaking machine having an air chamber above vertical rectangular guide vanes defining top open channels between adjacent vanes. The vanes define a first plurality of the channels with end portions open horizontally to provide for horizontal stock flow therethrough. The vanes define a second plurality of channels with bottom portions open in a vertically downward direction to provide for skimming the upper surface of stock in the headbox by providing for a vertically downward stock

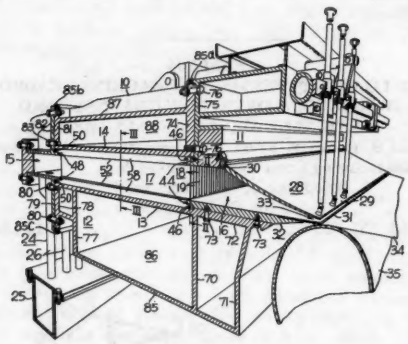
overflow from the tops of the open tops of the horizontal stock flow channels, downwardly through overflow channels to an overflow collection chamber beneath the vanes. The channels are arranged with alternate horizontal stock flow channels and stock overflow channels across the width of the headbox. A pair of spacers is arranged between vanes defining a stock overflow channel, with each overflow channel spacer being adjacent an end portion of adjacent vanes and extending vertically between top and bottom positions of the adjacent vanes. A group of three spacers is arranged between adjacent vanes defining a horizontal stock flow channel. A first spacer of the group of three, extends horizontally between front and rear wall assemblies of the headbox and provides a floor for the horizontal stock flow channel. The second and third spacers of the group of three are horizontally spaced apart with each adjacent an upper end of adjacent vanes.

3,661,705

PAPERMAKING MACHINE HEADBOX HAVING VERTICALLY ALIGNED VANES THEREIN

Donald B. De Noyer, Beloit, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 6, 1970, Ser. No. 87,378
Int. Cl. D21f *1/06*
U.S. Cl. 162—343 **8 Claims**



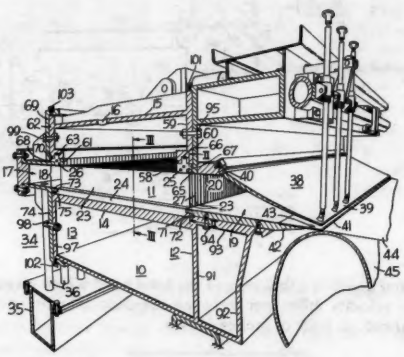
A headbox for a papermaking machine having vertical rectangular guide vanes defining channels therebetween for the flow of dilute paper stock toward a slice opening over a Fourdrinier wire. The guide vanes are provided with keys projecting horizontally from the vanes and into keyways defined by shelves projecting toward the guide vanes from vertical front and rear wall assemblies of the headbox. A pair of spacers is arranged between each pair of adjacent vanes, with one spacer providing a channel floor and the other spacer providing a channel ceiling. Each spacer has a key on both ends thereof. The keys of both the vanes and the spacers, in side abutting and alternating arrangement, project into a keyway. The keyways support the vanes and spacers between front and rear wall assemblies with cross-machine deflection of the flow passages, due pressure of pulp stock therein, being both minimized and made independent of headbox width. Pressurized chambers below and above the channels load the vanes and spacers against deflection in vertical planes defined by the vanes and spacers.

3,661,706

AIR LOADED HEADBOX FOR A PAPERMAKING MACHINE HAVING VERTICALLY ALIGNED VANES THEREIN

Donald B. De Noyer, Beloit, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 6, 1970, Ser. No. 87,384
Int. Cl. D21f *1/06*
U.S. Cl. 162—343 **9 Claims**



An airloaded headbox for a papermaking machine having an air chamber above vertical rectangular guide vanes defining horizontally extending channels between adjacent vanes for the flow of dilute paper stock toward a slice opening over a Fourdrinier wire. The guide vanes are provided with keys projecting vertically upward from each of the upper corners of each vane and with keys projecting horizontally from each of the four corners of each vane. The keys project into keyways defined by lands and shelves projecting toward the guide vanes from vertical front and rear wall assemblies of the headbox. Three spacers are arranged between each pair of adjacent vanes, with a first of the spacers providing a channel floor and a second and third of the spacers horizontally spaced apart and adjacent the upper corners of each vane and defining therebetween a channel top open to the air chamber for air loading stock flowing horizontally through the channels. The first spacer has a horizontally extending key on each end. The second and third spacers each have a vertical key projecting upwardly and a horizontal key projecting toward the adjacent vertical end wall. Each of the keys of both the vanes and the spacers, in side abutting and alternating arrangement, project into keyways in register therewith. The keyways support the vanes and spacers, with the vanes and channel floor spacers between front and rear wall assemblies providing for cross-machine deflection of the floor of the flow passages, due pressure of pulp stock therein, which is both minimized and made independent of headbox width. The vertical keys of the vanes provide for the vanes to tie together the front and rear wall assemblies to minimize deflection of the front wall assembly and slice defining structure toward the slice opening.

3,661,707

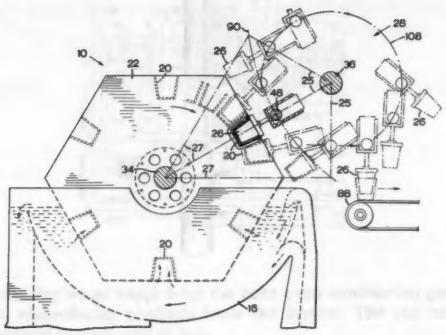
MOLDING MACHINE INCLUDING MATING OF FORMING AND TRANSFER MOLDS

Roy W. Emery, 1 Donino Court, Toronto 12, and John R. Emery, 46 Yorkminster Rd., Willowdale, Ontario, both of Canada

Filed July 7, 1969, Ser. No. 870,147
Claims priority, application Canada, Apr. 11, 1969, 048413
Int. Cl. D21j *7/00*
U.S. Cl. 162—392 **4 Claims**

This invention relates to a molding machine of the type used in the vacuum molding of wood pulp and like fibrous

materials. With machines of this type, it has been difficult to achieve a deep draw because the molding elements that form the molding material into a compressed molded article tend to become misaligned. This results in an imperfection or hole in the molded article. With this invention, the two mating molds are positively controlled as they are brought into alignment with each other, with the result that it is possible to mold articles having a much deeper draw than was previously possible. It is also possible to operate the machine at a faster rate of speed.



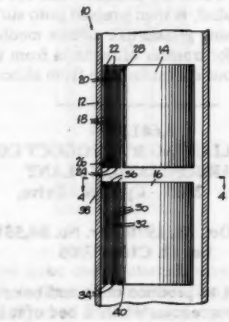
A plurality of forming and transfer molds, mounted on respective carriers, are carried into and out of cooperative relationship by a control mechanism performing 2 control functions. The first control function moves a single pivot axis of each transfer mold with respect to the axis of rotation of the transfer mold carrier to positively maintain the pivot axis on a predetermined line during transfer. The second control function positively rotates the transfer molds about the single pivot axis to align the central axes of the transfer and forming molds as they are carried into and out of cooperative relationship with each other.

3,661,708

FUEL SUBASSEMBLY FOR NUCLEAR REACTOR

Aaron J. Friedland, Oak Park, Mich., assignor to Atomic Power Development Associates, Inc., Detroit, Mich.

Filed May 9, 1968, Ser. No. 727,827
Int. Cl. G21c 7/30, 3/04
U.S. Cl. 176—28 **9 Claims**



A fuel subassembly for a nuclear reactor including a wrapper tube and an upper and lower core bundle assembly contained therein, one of the core bundle assemblies being connected to the wrapper tube in such a manner that when the temperature of the fuel subassembly increases said one core bundle assembly is axially displaced to a magnified extent with respect to the other core bundles assembly, and thus increases the negative feedback of the subassembly.

3,661,709

NONSWELLING URANIUM NITRIDE FUEL

Walston Chubb, Worthington; Donald L. Keller, Columbus; Richard A. Wullaert, Columbus, and Victor Storhok, Columbus, all of Ohio, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 6, 1970, Ser. No. 26,064
Int. Cl. G21c 3/20
U.S. Cl. 176—67 **4 Claims**

A high-temperature dimensionally stable nuclear reactor fuel element containing tungsten and uranium nitride in the form of a cermet or uranium nitride only in which the particle size of the fuel material is not larger than the grain size of the uranium nitride and in which the fuel region contains 20 to 30 volume percent of highly interconnected porosity evenly distributed throughout the fuel region.

3,661,710

SYNTHESIS OF CONJUGATED OCTADECATRIENOIC ACID USING ENZYMES FROM TUNG

Thomas J. Jacks, Metairie, and Lawrence Y. Yatsu, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 22, 1970, Ser. No. 39,921
Int. Cl. C12b 1/00
U.S. Cl. 195—30 **7 Claims**

Conjugated trienoic fatty acid was formed in a mixture containing CoASH, NADH, either ADP or ATP, $MgSO_4$, castor fatty acid, and enzyme prepared from tung nuts. The enzyme was prepared as a protein, which is soluble in 0.1 M tris- HCl buffer (pH 7.2), from acetone-insoluble powder of maturing tung nuts.

3,661,711

METHOD OF PRODUCING L-HISTIDINOL BY FERMENTATION

Koji Kubota, Kawaski-shi, and Teruo Shiro, Chigasaki-shi, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 23, 1968, Ser. No. 786,361
Claims priority, application Japan, Dec. 30, 1967, 42/85303
Int. Cl. C12b 1/00
U.S. Cl. 195—30 **7 Claims**

Histidinol is accumulated in histidine-containing, but otherwise conventional aqueous culture media on which histidine-requiring mutants of Brevibacterium, Corynebacterium, or Arthrobacter are cultured, and is readily recovered from the fermentation broth.

3,661,712

PROCESS FOR PRODUCING ZEARALENONE

Chester L. Keith, Manhattan, Kans., assignor to Commercial Solvents Corporation

Filed June 18, 1970, Ser. No. 47,637
Int. Cl. C12d 13/00
U.S. Cl. 195—36 R **18 Claims**

Zearalenone is produced in an agitated, aerated, aqueous fermentation medium containing submergible, zearalenone-producing strains of *Gibberella zeae* and nutrients including assimilable carbon, nitrogen, and mineral sources.

3,661,713

PROCESS FOR PRODUCING ZEARALENONE

James R. McMullen, Terre Haute, Ind., assignor to Commercial Solvents Corporation

Filed June 18, 1970, Ser. No. 47,638
Int. Cl. C12d 13/00
U.S. Cl. 195—36 R **14 Claims**

The production of zearalenone in a submerged fermentation process employing submergible, zearalenone-producing strains of *Gibberella zeae* is enhanced by inclusion of cationic zinc in the fermentation medium.

3,661,714

PROCESS FOR PRODUCING ZEARALENONE

Eric T. Woodings, Terre Haute, Ind., assignor to Commercial Solvents Corporation

Filed June 18, 1970, Ser. No. 47,639
Int. Cl. C12d *13/00*
U.S. Cl. 195—36 R 13 Claims

The production of zearalenone in a submerged fermentation process employing submergible, zearalenone-producing strains of *Gibberella zeae* is enhanced by partial replacement of the fermentation medium.

3,661,715

PROCESS FOR THE PREPARATION OF PROTEASES ACTIVE IN ALKALINE MEDIUM

Roger R. Bonnat, Saint-Gratien, and Bernard Ores, Montreuil-Sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

Filed July 22, 1969, Ser. No. 843,736
Claims priority, application France, July 22, 1968, 160344
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 R 3 Claims

The process comprises fermentating aerobically a Tracy strain of *Bacillus subtilis* in a nutrient medium comprising at least an assimilable carbon source, an assimilable nitrogen source and mineral substances, at a temperature range of about 28° to 40° C, the pH of the medium being adjusted between 7.5 and 9.5, at the beginning of the fermentation, by usual means, then, when the fermentation is over, acidifying the medium until a pH of approximately 4.5 by acetic and/or sulfuric acids, removing insoluble substances from the medium, treating the resulting clarified liquid phase with a mineral salt (for example, ammonium or alkaline sulfates), the pH being then brought close to 8.4 by means of a strong base, leaving the mixture under stirring and at last isolating the resulting precipitate.

The invention concerns also the proteases obtained by the process.

3,661,716

PROCESS FOR SIMULTANEOUS FRACTIONATION AND PURIFICATION OF PROTEASE AND RIBONUCLEASE OF RHIZOPUS MOLD

Juichiro Fukumoto, Takarazuka-shi, and Takehiko Yamamoto, Amagasaki-shi, both of Japan, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 8, 1969, Ser. No. 848,585
Claims priority, application Japan, Aug. 19, 1968, 43/59335
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 6 Claims

Purified fractions of protease and ribonuclease produced from a Rhizopus mold can be obtained by contacting a solution containing protease and ribonuclease with a cation-exchange material to selectively adsorb the ribonuclease. The purified protease fraction is then separated from the cation-exchange material. A purified ribonuclease fraction is then removed by elution, for example, from the cation-exchange material. The initial protease and ribonuclease-containing solution is preferably purified to remove amyloglucosidase and amylase prior to being separated into protease and ribonuclease fractions.

3,661,717

UNITARY STERILITY INDICATOR AND METHOD

Robert L. Nelson, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application Ser. No. 830,698, June 5, 1969. This application May 8, 1970, Ser. No. 35,763
Int. Cl. C12k *1/00*
U.S. Cl. 195—103.5 R 11 Claims

A unitary sterility indicator and a method for its use, the indicator comprising a deformable, translucent outer compartment having a closed, gas-transmissive, bacteria-impermeable opening therein and containing a predetermined number of viable microorganisms; a normally sealed, pressure-openable inner compartment snugly disposed in the outer compartment and containing an aqueous nutrient medium; and a detector material sensitive to microorganism growth and contained in one or both compartments.

3,661,718

METHOD FOR TAKING AND TRANSFERRING BACTERIA SAMPLES

Rose J. Sterling, Denver, Colo., assignor to Birko Chemical Corporation, Denver, Colo.

Filed Jan. 26, 1970, Ser. No. 5,702
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R 4 Claims

A tape dispenser, having means for supporting a nondrying adhesive tape therein, includes a depending mandrel having a flat surface of predetermined area. Tape from the roll is unrolled and pulled over the mandrel with the sticky side out. The flat surface of mandrel covered with the tape is pressed on a surface to be tested for bacteria, and the contaminated tape, over the mandrel, is then pressed onto surface of a culture medium. By using gelatin-like culture medium, it may be held upside down for transfer of bacteria from the dispenser, to prevent extraneous contamination from airborne bacteria.

3,661,719

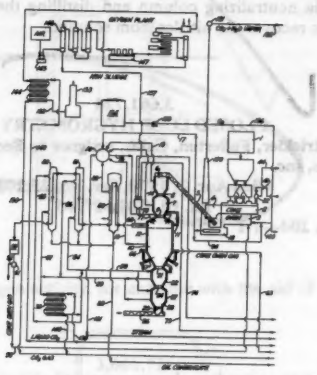
NON-POLLUTING BY-PRODUCT COAL CARBONIZATION PLANT

John J. Kelmar, 2205 Cypress Drive, White Oak, McKeesport, Pa.

Filed Oct. 28, 1970, Ser. No. 84,551
Int. Cl. C10b *57/06*
U.S. Cl. 201—17 13 Claims

As coal is heated to produce coke and coke oven gas the coke is delivered to a reactor where a bed of it is maintained. Most of the tar and ammonia and oil are removed from the coke oven gas and then the gas is passed through the coke bed. A tar plant receives the tar removed from the gas and produces coal tar pitch, which is delivered with calcium carbonate to the reactor to desulfurize the coke and gas therein and enriches the gas. The desulfurized gas is continuously removed from the reactor and cooled. Periodically a batch of desulfurized coke is withdrawn from the reactor. Steam is

produced in cooling the coke and is used in heating an ammonia still. Water from the still is processed and used in an ammonia scrubber along with make-up water produced by



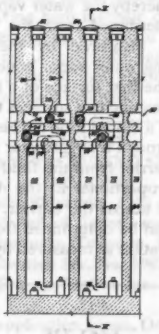
condensing water vapor from the coke oven combustion gas. Only nonpolluting products leave the system. The rest are consumed or recirculated in it.

3,661,720

APPARATUS FOR CONTROLLING THE SIZE OF GAS FLOW OPENINGS IN THE HEATING WALLS OF A COKE OVEN

Wilhelm Jakobi, Essen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 13, 1970, Ser. No. 54,479
Claims priority, application Germany, July 16, 1969, P 19 36 023.7
Int. Cl. C10b *5/04*
U.S. Cl. 202—139 **10 Claims**



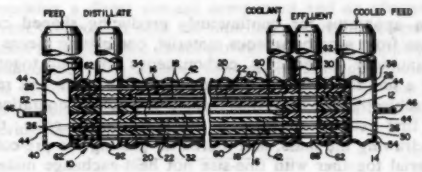
Regenerative coke oven batteries have heating walls with gas flow passages through transverse flue walls for the flow of gas between adjacent flues. During operation of the coke oven battery, the flow of gas through the passages in the flue walls is regulated for optimum heating of the carbonaceous material in the coke oven chamber. A cylindrically shaped damper brick formed of a refractory material is suitably supported adjacent to an opening in the passage and is rolled in preselected spaced relation to the passageway to regulate the size of the opening. The cylindrically shaped damper brick has a plurality of spaced notch-like recesses around the peripherally thereof to facilitate rotation of the damper brick on the support. The support for the damper brick includes a plurality of semi-cylindrical recessed portions spaced at predetermined distances in which the cylindrical damper brick may be positioned to control, with precision, the size of the flow opening. The flue wall has a plurality of horizontal passageways at different elevations that connect adjacent flues and regulate the height at which the gas flows from one flue to the adjacent flue. Support means extend horizontally within one of the flues at the same elevation as the respective passageways. Cylindrical refractory bricks are positioned on the supporting means and are arranged to be rolled into the passages in the flue wall. The passageways each have a transverse arcuate recessed portion for maintaining the cylindrical damper brick within the passageway.

3,661,721

COMPACT MULTISTAGE DISTILLATION APPARATUS HAVING STACKED MICROPOROUS MEMBRANES AND IMPERMEABLE FILMS

Franklin A. Rodgers, Brookline, Mass., assignor to Pactide Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 838,769, July 3, 1969, now abandoned , and a continuation-in-part of 838,872, July 3, 1969, now abandoned. This application Feb. 5, 1971, Ser. No. 112,854
Int. Cl. B01d *3/02*
U.S. Cl. 202—172 **25 Claims**



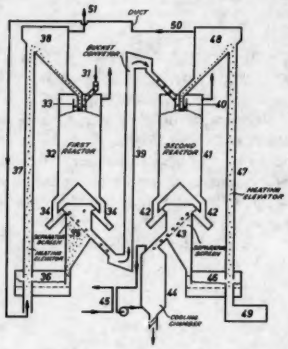
A still comprising a distillation unit formed by arranging microporous membranes and corrugated, impermeable films in alternating stacked relation together with adhesive sealing elements located between adjacent membranes and films and a spacer located between two stacks of membranes and films, to form channels for liquids. The assembly of membranes, films, sealing elements and spacer is subjected to heat and pressure to bond the sealing elements to the membranes, films and spacer, and holes are drilled through the unit to form conduits for feeding liquids to and from selected channels between adjacent membranes and films. The unit is then located together with sealing elements between the walls of two complimentary housing sections which are sealed to one another to form a housing enclosing the unit and subjected to heat and pressure to bond the unit to the walls of the housing to form additional liquid channels. The corners of the distillation unit are sealed to the corners of the housing to form chambers for receiving and distributing feed, heating, and coolant liquids. All of the components are designed to be fabricated or formed of polymeric sheet materials and connections for the flow of liquids are made to the conduits within the still (housing) by way of nipples secured to the housing and/or liquid conduits pressed into liquid-tight engagement with the housing. One surface of each member is corrugated to prevent blockage of the channels for feed liquid and the walls of the housing as well as the spacer are corrugated to provide channels for heating and coolant liquids.

3,661,722

APPARATUS FOR CARBONIZING CARBONACEOUS MATERIALS WITH DIRECT CONTACT HEAT EXCHANGE MATERIAL

Werner Peters, Wattenscheid; Horst Luther, Clausthal-Zellerfeld; Josef Langhoff, Dinslaken; Otto Abel, Clausthal-Zellerfeld, and Gerhard Schmeling, Koeln-Delbrueck, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Original application Aug. 26, 1968, Ser. No. 757,213. Divided and this application Oct. 20, 1969, Ser. No. 867,563
Claims priority, application Germany Aug. 25, 1967, B 94152
Int. Cl. C10b *1/04, 3/00*
U.S. Cl. 202—99 3 Claims



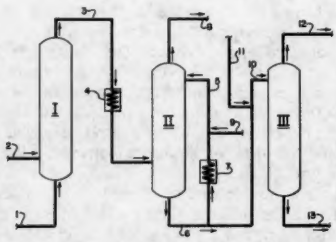
An apparatus for continuously producing shaped coke bodies from a carbonaceous material, comprising means for continuously introducing carbonaceous material together with a fine-size hot heat-exchange material into a first reactor, subjecting the mass thus formed to a coking operation in the first reactor to form a low-temperature coke, then withdrawing the mass, and thereafter passing the pre-coked material together with fine-size hot heat-exchange material into a second reactor and subjecting the mass therein to another coking operation at substantially higher temperatures than used in the first coking operation.

3,661,723

PROCESS FOR RECOVERING OF ACRYLONITRILE AND HYDROCYANIC ACID BY ADDITION OF ACETONITRILE TO THE AQUEOUS ACID NEUTRALIZED EFFLUENT

Kiyoshi Ohashi, Hiroshima; Morihiko Ohkuni, and Otoharu Kurayoshi, both of Yamaguchi, all of Japan, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 15, 1970, Ser. No. 37,520
Claims priority, application Japan, May 26, 1969, 44/40239
Int. Cl. B01d *3/34*; C07c *121/32*
U.S. Cl. 203—8 1 Claim



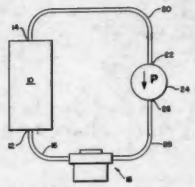
An improved process for the recovery of acrylonitrile, hydrocyanic acid, and acetonitrile from an aqueous solution of these nitriles wherein the aqueous solution is obtained by contacting the product mixture from a catalytic vapor phase reaction of propylene, ammonia, and air, with an acidic solution in an ammonia neutralization column to remove unreacted ammonia therefrom, where the improvement comprises adding additional acetonitrile to the effluent from the ammonia neutralizing column and distilling the aqueous effluent to recover the nitriles from solution.

3,661,724

CLOSED LOOP HYGROMETRY

Allen Strickler, Fullerton, Calif., assignor to Beckman Instruments, Inc.

Filed Apr. 2, 1970, Ser. No. 25,208
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T 25 Claims



Method and apparatus for determining water vapor concentration in a fluid. The apparatus includes a hygrometer having an inlet and outlet and a pump having an inlet and an outlet. A layer of semipermeable barrier material permeable to moisture and having two surfaces, the first surface being exposed to the fluid, is provided. Conduit means connects the pump, hygrometer, and the second surface of the barrier in series so that a carrier gas may be circulated by the pump in a closed loop across the second surface of the barrier and through the hygrometer. Water vapor may pass through the barrier from the fluid into the carrier gas at a transfer rate proportional to the difference in partial water vapor pressure across the barrier, whereby the water vapor concentration in the fluid can be determined from the proportional water vapor concentration measured by the hygrometer. The method of determining water vapor concentration in a fluid comprises exposing the first surface of a layer of semipermeable barrier material having two surfaces to the fluid. A carrier gas is circulated in a closed loop across the second surface of the barrier and through a hygrometer so that water vapor passes through the barrier from the fluid into the carrier gas at a transfer rate proportional to the difference in partial water vapor pressure across the barrier. The water concentration in the fluid can be determined from the proportional water vapor concentration as measured by the hygrometer.

3,661,725

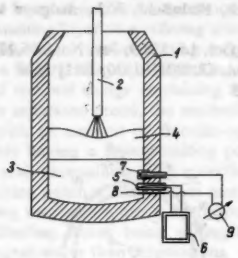
METHOD FOR DETERMINING THE CARBON CONCENTRATION IN A METAL MELT

Klaus-Herbert Ulrich, Dusseldorf; Dieter Doering, Essen-Holsterhausen, and Kurt Borowski, Essen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 24, 1969, Ser. No. 809,766
Claims priority, application Germany, Mar. 22, 1968, P 17 73 027.7
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T 1 Claim

A method for determining the carbon concentration in a metal melt. The oxygen activity in the melt is first deter-

mined from a measurement of the temperature and the oxygen potential. The carbon concentration is then determined



from the oxygen activity, for example with the aid of a suitable graph.

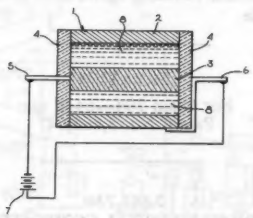
3,661,726

METHOD OF MAKING PERMANENT MAGNETS

Peter A. Denes, 9101 Crestwood Ave., Albuquerque, N. Mex.

Continuation-in-part of application Ser. No. 538,985, Mar. 31, 1966, now Patent No. 3,502,584, and a continuation-in-part of 9,939, Feb. 9, 1970, now abandoned. This application Mar. 23, 1970, Ser. No. 21,785

Int. Cl. C22d 5/00; C23b 5/00; B22f 3/00
U.S. Cl. 204—10 33 Claims



A method for making single phase or multiphase permanent magnets having high intrinsic coercivity, in which a molten state salt electrolysis technique is used to produce a variety of magnetic metallic or alloy particles, in controllable sizes. The magnetic particles thus produced are then bonded and formed into permanent magnets.

3,661,727

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Yokichi Itoh; Nobuhiko Shirasaka, both of Hachioji, and Shoji Tauchi, Kokubunji, all of Japan, assignors to Kabushiki Kaisha Hitachi Seisakusko, Tokyo-to, Japan

Continuation of application Ser. No. 490,597, Sept. 27, 1965, now abandoned. This application Jan. 29, 1970, Ser. No. 7,319

Claims priority, application Japan, Oct. 1, 1964, 39/55667
Int. Cl. C23b 3/04
U.S. Cl. 204—32 S 9 Claims

The method of plating a metal layer on a selected, clean surface of a semiconductor substrate with a metal provides for forming at first a layer of silicon dioxide on the substrate surface by the high temperature oxidation method, then forming a hollow on one part thereof, thereafter immersing the semiconductor substrate in a mixture of an etching solution and a metal-plating solution for a limited period of time sufficient for only a part of the silicon dioxide film positioning on this hollow part to dissolve and to expose a clean surface of the substrate and sufficient for a metal layer of a certain thickness to be metal-plated on the clean surface.

3,661,728

NICKEL PLATING OF NICKEL-COPPER PRINTED CIRCUIT BOARD

Emil Toledo, Natick, Mass., and Dennis R. Sprague, Fountain Valley, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 31, 1971, Ser. No. 130,029
Int. Cl. C23b 1/00, 5/50
U.S. Cl. 204—32 R 4 Claims

A process for plating nickel onto a nickel surface of a printed circuit board containing copper comprising first plating copper from a cyanide copper bath onto said nickel surface and then removing all said plated copper by reverse plating in the same cyanide copper bath and then plating nickel onto said nickel surface.

3,661,729

PROCESS FOR COLORING ANODIC COATINGS ON ALUMINUM AND ALUMINUM ALLOYS WITH METAL SALTS

Tadahito Miyakawa, No. 159, 2-chome, Horinouchi-machi, and Kazuko Nagai, No. 11, Hinogaoka, Noba-machi, both of Minami-ku, Yokohama City, Japan

Continuation-in-part of application Ser. No. 586,980, Oct. 17, 1966, now abandoned. This application Sept. 5, 1969, Ser. No. 855,769

Int. Cl. C23f 5/02
U.S. Cl. 204—35 N 4 Claims

Colored coatings are produced by first subjecting an aluminum or its alloys to anodic oxidation in an electrolyte containing mainly sulfuric acid, by supplying an electric current comprising a direct current component and an alternating current component with the alternating current component at least as large as the direct current component, dipping the oxide coating in an aqueous solution containing metallic cations or anions without supplying the electric current and then subjecting the coating to sealing treatment to produce coloring thereof.

3,661,730

PROCESS FOR THE FORMATION OF A SUPER-BRIGHT SOLDER COATING

Kazuo Nishihara, Tokyo, Japan

Continuation-in-part of application Ser. No. 600,044, Dec. 8, 1966, now abandoned. This application Sept. 22, 1969, Ser. No. 868,616

Int. Cl. C23b 5/38, 5/46
U.S. Cl. 204—43 3 Claims

A process for electrodepositing solder on a basis material from an aqueous, acidic bath comprising stannous and plumbous compounds, o-toluidine or a 2-alkyl anil as a brightening agent and a non-ionic surface-active agent as a dispersant, to obtain a super-bright solder coating on the basis material.

3,661,731

ELECTRODEPOSITION OF BRIGHT NICKEL

William R. Schevey, Hawley, Pa., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 16, 1970, Ser. No. 20,031
Int. Cl. C23b 5/08
U.S. Cl. 204—49 13 Claims

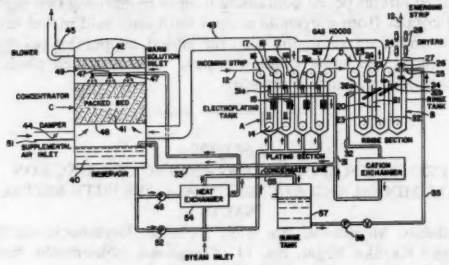
Acid nickel plating bath for obtaining bright nickel deposits, said bath being of the chloride, sulfate, fluoborate or sulfamate type and containing a brightener mixture comprising the disodium salt of methylene bis naphthalene sulfonic acid and a second component selected from coumarin, piperonal bisulfite complex, sodium beta-styrene sulfonate, benzimidazole and mixtures thereof, with the proviso that benzimidazole is used only when greater than 50 mole percent of nickel salt used in the bath is nickel fluoborate.

3,661,732

METHOD AND APPARATUS FOR ELECTROPLATING

David A. Withrow, Willoughby, Ohio, assignor to Production Machinery Corp., Mentor, Ohio

Filed June 1, 1970, Ser. No. 42,435
Int. Cl. B01k 3/00; C23b 5/68, 5/06
U.S. Cl. 204—51 31 Claims



This invention concerns an improved method and apparatus for electroplating in which rinse solutions and fumes from electroplating operations are treated to recover values contained therein, and to simultaneously adjust the concentration and the temperature of the electroplating bath. Fumes and spray from the electroplating and rinsing operations are contacted with controlled amounts of a process solution comprising overflow rinse water mixed with electroplating bath solution. The liquid-vapor contacting operation is controlled to evaporate water at a rate substantially equivalent to the rate of addition of rinse water to the process so that a water balance is maintained throughout the system, and to cool the process solution. The process is preferably conducted in apparatus comprising an electroplating tank, a rinse tank, a fume exhaust system, a heat exchanger and a liquid-vapor contacting means.

3,661,733

CHROMIUM ELECTROPLATING

Wilhelm Roggendorf, Kehl am Rhein, Germany

Continuation of application Ser. No. 578,965, Sept. 13, 1966, now abandoned. This application July 2, 1969, Ser. No. 838,703
Claims priority, application Germany, Jan. 18, 1966, R 42442
Int. Cl. C23b 5/06
U.S. Cl. 204—51 2 Claims

An improved electrolytically deposited chromium coating is provided having an improved mirror-like brightness using an aqueous solution in the nature of a Bornhauser solution and ions of the class consisting of hexafluoantimonate and hexafluostannate, as stable catalysts and brightening agents and within a critical content of about 0.7 to 4 percent with relation to the chromium trioxide content.

3,661,734

CARBONATE REMOVAL

Walter John Sloan, Newark, Del., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed July 2, 1970, Ser. No. 52,142
Int. Cl. C23b 5/48; B01d 15/00, 19/00
U.S. Cl. 204—52 Y 4 Claims

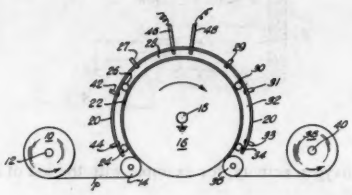
Removal of carbonate ions from cyanide-containing electroplating baths, or bath rinse solutions by contacting with an acid ion exchange resin, and liberating the carbon dioxide formed as off gas.

3,661,735

SHAPED ARTICLES HAVING IMPROVED SURFACE PROPERTIES AND CORONA DISCHARGE METHODS AND APPARATUS FOR MAKING THE SAME

Arthur H. Drelich, Plainfield, N.J., assignor to Johnson & Johnson

Filed Oct. 14, 1969, Ser. No. 866,220
Int. Cl. B01k 1/00; B01j 1/00
U.S. Cl. 204—165 6 Claims



Films, sheets, expanded or foamed products, fibrous webs, and similar synthetic, organic, polymeric shaped articles and structures having surfaces with improved bonding and adhesion capabilities, increased fluid absorbency rates, and enhanced fluid wicking properties; and processes and apparatus for obtaining such improved capabilities and enhanced surface properties and characteristics by exposing said shaped articles to the action of an electrical corona discharge in an atmosphere of a reactive gas which does not have an affinity for electrons and which is also capable of acting as a chemical reducing agent, such as carbon monoxide, for example.

ERRATUM

For Class 204—64 T see:
Patent No. 3,662,047

3,661,736

REFRACTORY HARD METAL COMPOSITE CATHODE ALUMINUM REDUCTION CELL

Robin D. Holliday, New South Wales, Australia, assignor to Olin Mathieson Chemical Corporation

Filed May 7, 1969, Ser. No. 822,395
Int. Cl. C22d 3/12, 3/02; B01k 3/06
U.S. Cl. 204—67 15 Claims

The present invention is directed to cathodes of fused refractory hard metal alloy composited with certain bonding agents and their use, replacing the conventional carbon lining of an aluminum reduction cell.

3,661,737

RECOVERY OF VALUABLE COMPONENTS FROM MAGNESIUM CELL SLUDGE

John G. Scherer, Tulsa, Okla., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 29, 1969, Ser. No. 872,364
Int. Cl. C22d 3/08; C22b 45/00, 9/10
U.S. Cl. 204—70 8 Claims

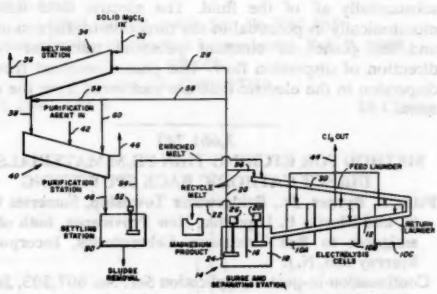
Method for recovering valuable components from a molten admixture of fused magnesium salt, disperse magnesium

metal and other substances, e.g. magnesium electrolytic cell sludge, including holding such admixture in fused state, under a fluoride-containing protective flux for magnesium metal, to form a layer of magnesium dispersed in a sludge and a separate layer of purified magnesium salt, withdrawing the metal-containing layer to a refining zone and thoroughly admixing therewith a metal-collecting magnesium fluoride-containing flux to form a layer of separated magnesium metal and a layer of residual sludge containing magnesium metal, recovering the separated metal, the residual sludge can then be admixed with an amount of fluoride-containing flux to form a eutectic having a lower melting point than that of magnesium metal, maintaining such eutectic in molten form below the melting point of magnesium metal, and mechanically recovering magnesium metal therefrom, the protective and metal-collecting fluxes being substantially free of alkaline earth metals other than magnesium.

3,661,738
SYSTEM FOR MELTING MELT ENRICHING SOLIDS UTILIZING EXCESS HEAT FROM ELECTROLYSIS CELLS

Roger M. Wheeler, Tulsa, Okla., and Frank E. Love, Snyder, Tex., assignors to American Magnesium Company, Tulsa, Okla.

Filed June 29, 1970, Ser. No. 50,849
Int. Cl. C22b *45/00*; B01k *3/00*
U.S. Cl. 204—70 **14 Claims**



A method of melting melt enriching solids to provide cell melt to an electrolysis cell for the production of magnesium and chlorine comprising withdrawing hot depleted cell melt from the electrolysis cell, conveying the depleted melt to a mixing station, admixing melt enriching solids with the depleted cell melt in the mixing station, the melt enriching solids being melted by heat of the depleted cell melt which is thereby enriched and cooled, and conveying the enriched cell melt to the electrolysis cell.

3,661,739
METHOD OF ELECTROCHEMICAL HYDRODIMERIZATION OF OLEFINIC COMPOUNDS

Andrei Petrovich Tomilov, 5 Parkovaya ulitsa 56, korpus 6, kv. 59; Vladimir Alexeevich Klimov, Butyrsky val, 26, kv. 50, and Semen Lvovich Varshavsky, ulitsa Pavla Andreeva, 28, kv. 282, all of Moscow, U.S.S.R.

Filed Sept. 29, 1969, Ser. No. 862,010
Claims priority, application U.S.S.R., Sept. 28, 1969, 1275670
Int. Cl. C07b *29/06*; C07c *121/26*
U.S. Cl. 204—73 A **8 Claims**

A method of electrochemical dimerization of olefinic compounds of the general formula CH_2 CHX, wherein X is a nitrile, ester, amide, aldehyde or carboxy group, according to which a mixture consisting of an aqueous solution of acid salts of an alkali metal and polybasic acid and olefine is subjected to electrolysis in an electrolytic cell provided with an oxide anode and with a cathode made of graphite impregnated with ion-exchange polymers that are insoluble in the reaction mixture and contain a tetraalkylammonium group or a substituted tetraalkylammonium group, the electrolysis being effected at a cathode current density of 300–1,600 A/m², a pH of 7–9, and at a temperature of 17°–25°<⅔ C.

3,661,740
RECOVERY OF COPPER FROM COPPER ORES

Eldred C. Brace, and George E. Green, both of Tucson, Ariz., assignors to Banner Mining Company, Tuscon, Ariz.

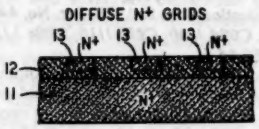
Filed July 13, 1967, Ser. No. 653,158
Int. Cl. C22d *1/16*
U.S. Cl. 204—96 **9 Claims**

A method of recovering of oxidized copper from limestone gangue ores in which finely ground ore is leached with a caustic solution with gentle agitation and heat in stages, pregnant caustic solution from a succeeding stage being used to leach ore in a preceding stage; the ore in the final stage is leached with a copper barren caustic solution with gentle agitation and heat; copper sponge produced from the pregnant caustic solution by electrolysis, and the resulting copper barren caustic returned for re-use. Lime is used to recausticize dilute caustic from the final wash of the solids, and the thus recausticized solution is concentrated and also returned for re-use.

3,661,741
FABRICATION OF INTEGRATED SEMICONDUCTOR DEVICES BY ELECTROCHEMICAL ETCHING

Ronald Lee Meek, Pottersville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 7, 1970, Ser. No. 78,698
Int. Cl. B22p *1/00*
U.S. Cl. 204—143 GE **5 Claims**



Grid-like zones of P or N type high conductivity material are formed in the surface of an N type higher resistivity epitaxially deposited layer on a high conductivity substrate of a body of silicon semiconductor material. The surface of the N type layer then is covered with a dielectric film of silicon nitride and a support layer of polycrystalline silicon. The body then is immersed in a suitable bath and subjected to an electrochemical etch which removes the high conductivity substrate and, in line with the grid-like zones, channels are etched through the N type layer and the grid-like zones, leaving completely isolated blocks of the N type layer affixed to a common support member. Following such shaping of isolated blocks of the N type layer integrated circuits are fabricated by applying insulating films over the exposed surface of the block and otherwise carrying out well-known EPIC-type fabrication procedures.

3,661,742
ELECTROLYTIC METHOD OF MARINE FOULING CONTROL

Oliver Osborn, and Bernard L. Prows, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 22, 1970, Ser. No. 48,523
Int. Cl. C23f *13/00*
U.S. Cl. 204—147 **7 Claims**

An improved method of inhibiting the sustained attachment of marine organisms to metallic surfaces while

preventing corrosion of the metallic surface by cathodic protection. Inhibition of marine organism attachment takes place when toxic ions are forced into solution by reversing and increasing the current density in the cathodic protection system at periodic intervals for a short period of time.

3,661,743

PHOTOCHEMICAL PROCESS FOR PREPARING BETA-THIOLACTONES

Arleen C. Pierce, Monmouth Junction, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Original application Oct. 6, 1967, Ser. No. 673,259, now Patent No. 3,520,903. Divided and this application Apr. 20, 1970, Ser. No. 38,613

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 R 10 Claims

This specification discloses a process for the preparation of β-thiolactones whereby carbonyl sulfide is reacted with an ethylenically unsaturated compound in the presence of actinic radiation having a wave length between 2,800 and 3,600 Angstrom units. This process can be used to prepare known β-thiolactones and novel perhalogenated β-thiolactones which are useful as monomers for the preparation of polyesters as well as chemical intermediates for the preparation of thiocarboxylic acids or their ester and amide derivatives.

3,661,744

PHOTOCURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITIONS

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of application Ser. No. 617,801, Feb. 23, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 567,841, July 26, 1966, now abandoned. This application June 8, 1970, Ser. No. 44,607

Int. Cl. C08d *1/00;* C08f *1/16;* C08c *11/54*

U.S. Cl. 204—159.14 31 Claims

The invention disclosed is for a new photocurable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain of the molecule, a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule, and a photocuring rate accelerator. The photocurable liquid polymer composition upon curing in the presence of actinic light forms odorless, solid, elastomeric or resinous products which may serve as sealants, coatings, adhesives and molded articles.

3,661,745

SYNTHESIS OF DODECYL MERCAPTAN USING HIGH ENERGY RADIATION

Peter Robert Hills, Abingdon; Michael William Spindler, Cowley, and Kenneth Wallace Carley-Macauly, Didcot, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sept. 30, 1968, Ser. No. 763,652

Claims priority, application Great Britain, Sept. 29, 1967, 44,602/67

Int. Cl. B01j *1/10*

U.S. Cl. 204—162 HE 2 Claims

A process is disclosed for the synthesis of dodecyl mercaptan from a 50:50 mixture of dodecene and hydrogen sulphide at a temperature in the range 0° - 50° C. and a pressure of about 20 atmospheres, using cobalt-60 radiation to effect the reaction. A full flow sheet is described.

3,661,746

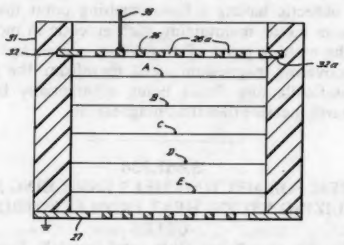
UNIFORM ELECTRIC FIELD TREATMENT

Roy N. Lucas, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Original application May 15, 1969, Ser. No. 825,015, now Patent No. 3,582,527, dated June 1, 1971. Divided and this application Jan. 19, 1971, Ser. No. 107,770

Int. Cl. B03c *5/00*

U.S. Cl. 204—188 10 Claims



A method for electrically resolving a dispersion consisting of immiscible and liquid phases. The dispersion flows along a vertical flow axis between inlet and outlet zones. An electric field for resolving the dispersion is established in a region between inlet and outlet zones through which region passes substantially all of the fluid. The electric field increases monitonically in potential in the direction of dispersion flow and has planes of constant potential transverse to the direction of dispersion flow. The phases resolved from the dispersion in the electric field are recovered from the outlet zone.

3,661,747

METHOD FOR ETCHING THIN FILM MATERIALS BY DIRECT CATHODIC BACK SPUTTERING

Peter A. Byrnes, Jr., Bridgewater Township, Somerset County, and Martin P. Lepselter, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 607,203, Jan. 4, 1966. This application Aug. 11, 1969, Ser. No. 848,935

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 3 Claims

Thin layers of material including dielectric films are etched or cleaned by placing them in a low pressure gas ambient, forming a plasma in the ambient, and establishing a periodic voltage between the layers and the plasma. One important application of the process is the formation of metal silicide contacts through small windows in a dielectric layer protecting the silicon surface. In one application, the metal is sputtered onto the exposed silicon at the same time that the surface is subjected to ion bombardment. The sputtering and etching rates are adjusted so that some of the sputtered metal reacts with the silicon upon impact and the unreacted metal is etched away.

3,661,748

FAULT SENSING INSTRUMENTATION

David E. Blackmer, Harvard, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

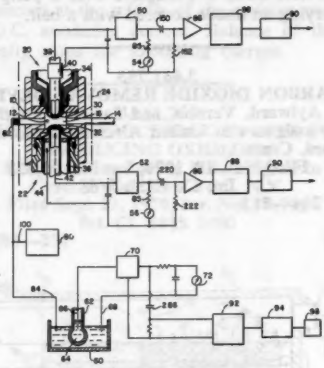
Filed Apr. 7, 1970, Ser. No. 27,197

Int. Cl. B01k *3/00*

U.S. Cl. 204—195 7 Claims

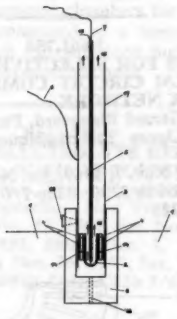
An electrochemical sensor system includes an electrode assembly that produces a DC signal as a function of a parameter of interest sensed by the electrode system. An AC signal is applied via an electrode to the conductor fluid in which the electrode system is disposed and an AC signal detector is

connected to the DC circuitry. A threshold circuit responsive to the output of the AC signal detector indicates fault in the



electrochemical sensor system whenever the AC signal detector has an output of predetermined magnitude.

3,661,749
APPARATUS FOR MEASURING IN A CONTINUOUS MANNER THE OXYGEN IN A MOLTEN METAL
Frederick Denys Richardson, Epsom, Surrey, England, assignor to Metallurgie Hoboken, Brussels, Belgium and RST International Metals Limited, London, England, part interest to each
Filed Jan. 27, 1969, Ser. No. 794,335
Claims priority, application Luxembourg, Feb. 9, 1968, 55,448
Int. Cl. G01n *27/30*
U.S. Cl. 204—195 S **16 Claims**

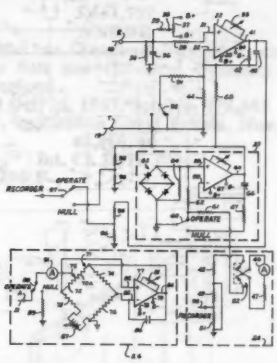


Apparatus for the continuous measurement of oxygen contained in a molten metal which comprises

a. a solid oxygen electrolyte tube;
b. a reference electrode having known oxygen potential in contact with the inner surface of the tube;
c. means for measuring the electrochemical potential present between the inner and outer surfaces of the tube; and
d. insulating means to protect the solid oxygen electrolyte tube against chemical attacks, thermal shocks and mechanical stress due to the contact with the liquid molten metal.

The insulating means is a tube made of a metal containing substance having a high resistance to mechanical stress, to thermal shocks, to chemical attack, to splashing of the metal which is to be tested and to the slag of the metal which is to be tested. In addition the insulating means closely surrounds the solid oxygen electrolyte tube and is open at the bottom so that the outer surface of the tube can be directly contacted with the molten metal which is to be tested.

3,661,750
CORROSION RATE METER
Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.
Filed Aug. 28, 1969, Ser. No. 853,640
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **11 Claims**

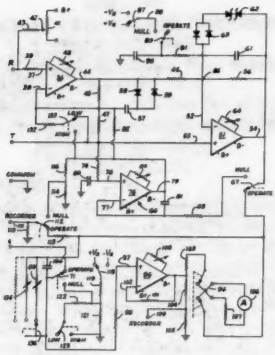


A corrosion rate meter with metallic electrodes contactable by a corrodent, including a test specimen electrode, a reference electrode, and a third or auxiliary electrode. A source of direct current passes between the test and third electrodes, at selected intervals, a predetermined, relatively constant current whereby a polarization potential is created between the test and reference electrodes. An isolation amplifier; with an input circuit between the test and reference electrodes, provides in its output circuit an output signal representative of the potential difference between these electrodes. A signal correction means applies a corrective signal to the input circuit of the isolation amplifier. The corrective signal removes from the output signal of the isolation amplifier any component representing the potential difference present between the test and reference electrodes intermediate the intervals of current flow creating the polarization potential. A readout means connects to the output circuit of the isolation amplifier to measure the output signal representative of the polarization potential (and corrosion rate) created between the test specimen and reference electrodes.

3,661,751
CORROSION RATE METER
Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.
Filed Oct. 30, 1969, Ser. No. 872,694
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **16 Claims**

A corrosion rate meter with test specimen, reference and third electrodes contactable by a corrodent. An isolation amplifier provides an output signal representative of the potential difference between the test and reference electrodes. An output amplifier produces output current having a predetermined relationship to this output signal and a reference current signal representing a certain polarization potential to be established between the test and reference electrodes. A signal correction means stores an integrated corrective signal derived from the current from the output amplifier. The corrective signal adjusts the output signal of the isolation amplifier for a component representing the potential difference between the test and reference electrodes but not the polarization

potential component which removes the reference current signal. Then, the output amplifier passes current between the test and third electrodes to produce a polarization potential between the test and reference electrodes. The output signal from the isolation amplifier is now free of



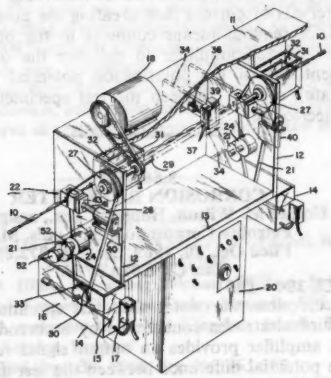
both corrective signal components to control the output amplifier to that current magnitude creating the certain polarization potential between the reference and test electrodes. A readout means measures the output current from the output amplifier which is representative of the corrosion rate occurring at the test electrode.

3,661,752

BELT PLATING APPARATUS

Harry Milton Capper, Harrisburg, Harold Oakley Woolley, Jr., Hershey, Clifton Eugene Lemons, Hummelstown, and Richard Maxwell Wagner, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 23, 1970, Ser. No. 49,089
Int. Cl. C23b *5/68*
U.S. Cl. 204—206 **16 Claims**



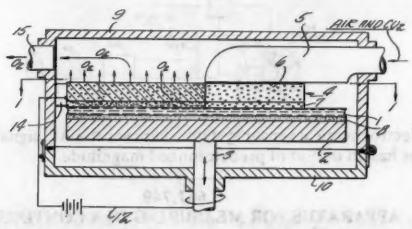
A novel dual head belt plater has been disclosed which can plate continuously selected portions of a stamped strip forming an electrical connector component blank or a blank as a part of a connector. Another embodiment of the novel belt plater allows continuous plating with one or more metals a continuous strip on a different metal whereby an electrodeposit of a certain or varying width is obtained. In a further embodiment, a machine accomplishes plating in a substantially continuous manner by moving continuously a workpiece over a periphery of a drum carrying an anode covered with a belt.

3,661,753

CARBON DIOXIDE REMOVAL DEVICE

John R. Aylward, Vernon, and James I. Smith, Enfield, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 18, 1970, Ser. No. 90,533
Int. Cl. C23b *5/68*
U.S. Cl. 204—212 **7 Claims**



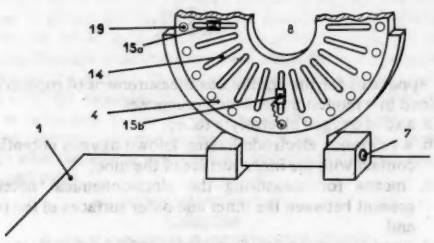
A device for selectively removing CO_2 directly from a breathable atmosphere under zero gravity conditions, said device including an anode and cathode with a fused electrolyte layer disposed therebetween. The electrolyte is arranged so as to be exposed, for a short time, to the atmosphere whereby the CO_2 is absorbed. Then the electrolyte is moved to a field between the anode and cathode whereby absorbed CO_2 is decomposed into carbon and oxygen.

3,661,754

APPARATUS FOR SELECTIVELY ADJUSTING THIN FILM CIRCUIT COMPONENTS OF A COMPLEX NETWORK

Jean Joly and Gerard Blangeard, Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

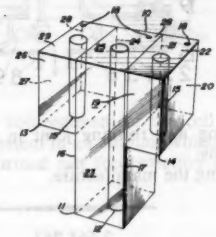
Filed Nov. 7, 1969, Ser. No. 874,807
Int. Cl. B01k *3/00*; B23p *1/02*; C23b *5/70*
U.S. Cl. 204—228 **4 Claims**



A method and an apparatus for carrying out said method for selectively adjusting by anodization the resistors of a thin film or hybrid circuit. The circuit is positioned under a thick mask provided with holes registering with the resistors on the circuit lay-out. A jellied electrolyte is spread over the circuit through the mask which is removed. Electrodes prepositioned with respect to the lay-out are placed on the electrolyte spots which are connected to an equipment. Each resistor is associated

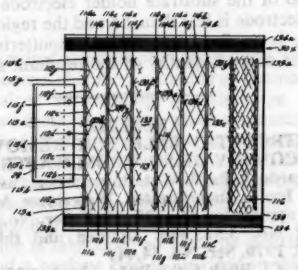
with three electrodes: two located at each end and connected in an arm of a measuring A.C. bridge, another arm of which is connected to the standard resistor, the third connected at the middle of the resistor and supplying the D.C. anodizing current. Balance of the bridge automatically stops the anodizing current.

3,661,755
NOVEL ELECTROCHEMICAL CELL FOR PRODUCING OXIDIZERS
Arvind S. Patil, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.
Filed Sept. 23, 1970, Ser. No. 74,715
Int. Cl. B01k *3/00*
U.S. Cl. 204—271 **9 Claims**



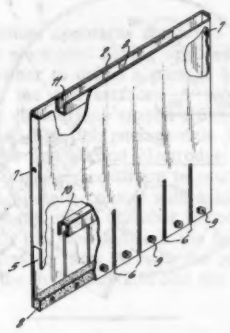
A dip-type electrochemical cell for the electrolysis of salt solutions, particularly halogen salt solutions. Said electrochemical cell comprising at least one anode and at least one cathode wherein the ratio of the total active anode surface area to the total active cathode surface area is within the range of about .1 to about 10, but most preferably 1; and preferably having a non-porous plastic housing comprising separate chambers for the electrodes. Said electrodes are composed of a non-corroding conducting material which can withstand highly alkaline or acidic conditions on a continuous basis.

3,661,756
CATHODE FOR ELECTROLYTE REFINING OF METAL, SUCH AS COPPER
Bill Hugh Spoon, El Paso, Tex., assignor to Phelps Dodge Refining Corporation, New York, N.Y.
Original application Feb. 15, 1967, Ser. No. 616,315, now Patent No. 3,544,431, dated Dec. 1, 1970. Divided and this application Dec. 16, 1969, Ser. No. 885,513
Int. Cl. B01k *3/04*; C23b *5/68*
U.S. Cl. 204—286 **4 Claims**



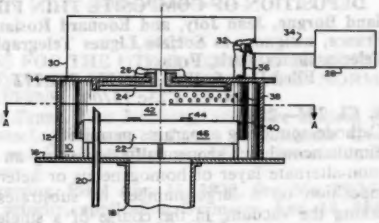
Cathode for electrolytic refining of metal, such as copper, to produce cathodes of commerce wherein a substantial thickness of the metal is electrolytically deposited on both sides of thin starting sheets to produce intermediate cathodes which are then subjected to a pressing operation to stress the metal over the area of the intermediate cathode sheets to cold work the metal and stress it to beyond its elastic limit, after which the metal is electrolytically deposited on both sides of the intermediate cathode sheets to a thickness suitable for metal cathodes of commerce.

3,661,757
ANODE
Derek Colin McLean, Sandbach, England, assignor to Murgatroyd's Salt and Chemical Company Limited, Sandbach, England
Filed Oct. 26, 1967, Ser. No. 678,343
Claims priority, application Great Britain, Nov. 8, 1966, 49,880/66
Int. Cl. B01k *3/04*
U.S. Cl. 204—290 F **3 Claims**



The invention is an anode suitable for use in an electrolytic cell. It comprises a box-like structure, open at either end, of titanium or a similar metal and has at least two parallel plates having at least part of their outer surfaces coated with a platinum group metal. Means are provided to prevent substantial deformation of the anode when the lower edge is cast in a conducting metal in the cell.

3,661,758
RF SPUTTERING SYSTEM WITH THE ANODE ENCLOSING THE TARGET
Weldon H. Jackson, Sunnyvale, and Billie J. Robison, Palo Alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed June 26, 1970, Ser. No. 50,103
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **1 Claim**



The plasma in an RF sputtering system is confined to the region between the anode and target by enclosing the target with the anode. The anode is in two parts which are

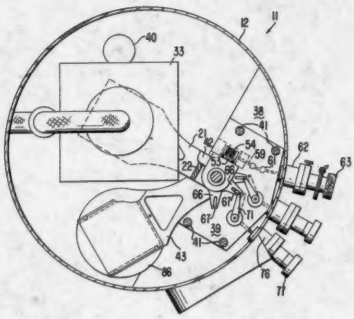
connected electrically through sliding contacts that allow removal of one of the parts for access to the interior region of the anode.

3,661,759

VACUUM COATING APPARATUS HAVING MEANS FOR POSITIONING ONE OF A PLURALITY OF MEMBERS AT A SELECTED LOCATION BETWEEN THE SUBSTRATE AND THE COATING MATERIAL SOURCE

Harold William Bruce, Palo Alto, and Werner E. Sandvoss, San Jose, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Feb. 19, 1970, Ser. No. 12,561
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 12 Claims



A vacuum coating apparatus of the gaseous discharge sputtering type is described. Such apparatus includes a target electrode, means for initiating and sustaining a gaseous discharge for sputtering coating material from a target positioned at the target electrode, and a substrate holder for supporting a substrate in the line-of-sight of the target for receiving coating material sputtered therefrom. Mechanisms are included for positioning any one of a plurality of coating masks over the substrate to provide a desired coating pattern, and for positioning any one of a plurality of sputter targets at the target electrode to obtain sputtering of, and consequent coating by, different materials. Actuation mechanism extends to the exterior of the vacuum chamber housing the sputtering apparatus for actuating both the mask moving and target moving mechanisms from the exterior of the chamber.

3,661,760

CATHODE SPUTTERING APPARATUS FOR THE DEPOSITION OF COMPOSITE THIN FILMS

Roland Borgne, Jean Joly, and Edouard Rosiaux, Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Dec. 6, 1968, Ser. No. 781,772
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 1 Claim

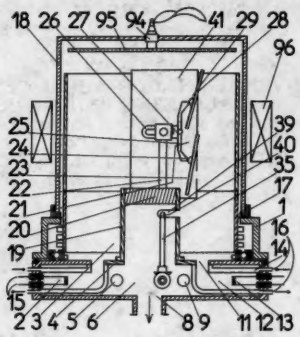
Cathode sputtering apparatus permitting:

Simultaneously or sequentially depositing an alternate or non-alternate layer of homogeneous or heterogeneous composition on a large number of substrates without breaking the vacuum, in the course of a single cathode sputtering operation;

Adjusting the distance and the orientation of centrally located targets;

Disposing the substrates on an object holder rotating continuously about the targets;

Carrying out the thickness monitoring measurements of the deposits outside the zones of circulation of the beams of charged particles, in the course of the deposition;



Eliminating any rotating joint in the construction of the apparatus;

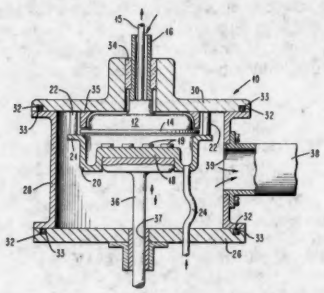
Automating the manufacture.

3,661,761

RF SPUTTERING APPARATUS FOR PROMOTING RESPUTTERING OF FILM DURING DEPOSITION

Harold R. Koenig, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1969, Ser. No. 829,633
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 9 Claims



An RF sputtering method and apparatus wherein the area ratio of the substrate holder electrode to the target holder electrode is less than 2.5 and the region of the glow discharge is confined to promote resputtering, which improves the over-all quality of the resultant sputtered film.

3,661,762

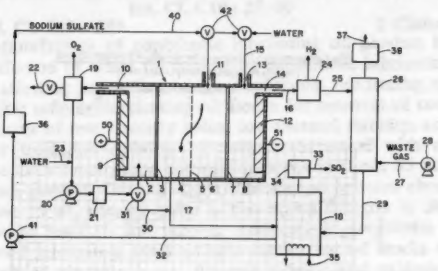
ELECTROLYTIC CELL FOR REMOVAL AND RECOVERY OF SO_2 FROM WASTE GASES

Edgardo J. Parsi, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Original application Dec. 27, 1967, Ser. No. 693,903, now Patent No. 3,523,880. Divided and this application May 4, 1970, Ser. No. 34,441
Int. Cl. B01k *5/00;* B01d *13/02;* C23b *13/00*
U.S. Cl. 204—301 10 Claims

This invention relates to a four compartment electrolytic cell for converting a salt solution feed into its corresponding acid, acid salt and caustic solution for use in connection with a liquid SO_2 absorption system. The caustic

produced absorbs the SO_2 gas and on exhaustion is neutralized with the acid salt to reform the original salt feed solution. The desorbed SO_2 gas is collected and the salt solution recycled as feed to the cell. The acid pro-



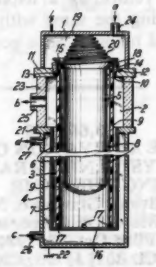
duced in the anode compartment of the cell is removed from the scrubber system in an amount which is sufficient to maintain the reformed salt feed solution substantially neutral in pH.

3,661,763

TUBULAR OZONIZER

Joseph Cremer, Hermulheim, near Cologne, and Herbert Panter, Kurt-Alstadten, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Mar. 18, 1969, Ser. No. 808,228
Claims priority, application Germany, Apr. 2, 1968, P 17 67 109.9
Int. Cl. C01b *13/12*
U.S. Cl. 204—321 **10 Claims**



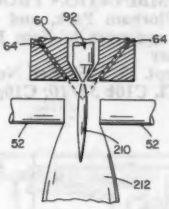
Tubular ozonizer substantially comprising an oxygen chamber, an ozone chamber, a discharge chamber and a coolant container surrounding the discharge chamber bounded by two metal electrodes, which are concentrically telescoped one into the other, have an open upper end and a closed lower end, and have an associated dielectrical tube arranged therebetween so as to leave two discharge spaces. The partition plate between the ozone chamber and oxygen chamber is formed with a bore into which the dielectrical tube is telescoped so as to be radially spaced therefrom, and a packing ring is provided in the annular gap left between the dielectrical tube and the wall of the bore in the partition wall, the packing ring having a centering ring mounted thereon to provide support for the upper flanged edge of the tensionally held, inner electrode.

3,661,764

MATERIAL TREATMENT APPARATUS

Lawrence W. Scammon, Jr., Concord, N.H., assignor to Humphreys Corporation, Bow, N.H.

Filed Nov. 14, 1969, Ser. No. 876,741
Int. Cl. C22d *7/08*
U.S. Cl. 204—325 **35 Claims**



Material treatment apparatus comprises a chamber, a plurality of first electrodes having opposed end surfaces adjacent one another to define a passage having an axis passing between the end surfaces. A second electrode structure has its end surface spaced from the first electrodes and aligned with the passage axis. Circuit means energizes the first and second electrodes to produce a high intensity electric arc condition to establish an elongated high enthalpy zone coaxial with said passage axis. Entrance port means in the chamber introduces material to be treated into the zone between the first and second electrode structures for flow through the passage defined by the faces of the first electrodes and the high enthalpy zone.

3,661,765

PROCESS FOR PRODUCTION OF GILSONITE-LIKE BITUMINOUS MATERIAL

Mitsuru Toyoguchi, Yokohama, and Hiroshi Iijima, Tokyo, Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan

No Drawing. Filed July 30, 1970, Ser. No. 59,725
Claims priority, application Japan, Aug. 4, 1969, 44/60,992
Int. Cl. C10g *27/04*; C10c *3/04, 1/20*
U.S. Cl. 208—6 **13 Claims**

A process for the production of a gilsonite-like bituminous material having a penetration of 0 to 1 and a softening point of 130° C. to 180° C. which comprises solvent extracting a material selected from the group consisting of straight asphalt and the vacuum distillation residue obtained in the production of lubricating oils to obtain a material having a penetration of 2 to 30, and then air blowing said material having a penetration of 2 to 30 at a temperature of 200° to 300° C.

3,661,766

PROCESS FOR THE UTILIZATION OF EMULSIONS OF AQUEOUS UREA SOLUTION AND NORMAL PARAFFINS

Hermann Franz, Neu Isenburg, and Max Kunert, Neu Wulmstorf, Germany, assignors to Edeleanu Gesellschaft m.b.H., Frankfurt am Main, Stresemannallee, Germany

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,254
Claims priority, application Germany, Apr. 18, 1969, P 19 19 664.6
Int. Cl. C10g *43/04*; C07b *21/00*
U.S. Cl. 208—25 **7 Claims**

An emulsion of normal paraffins and aqueous urea solution formed during the decomposition of a normal paraffin-urea adduct is resolved by admixing water and a

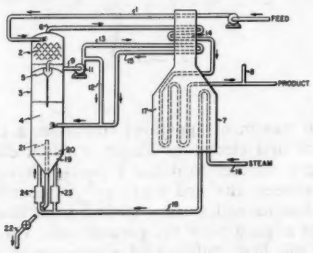
chlorinated hydrocarbon solvent with the emulsion, filtering and allowing the mixture to settle whereby two phases are formed, one comprising normal paraffins and chlorinated hydrocarbon and the other comprising aqueous urea solution.

3,661,767

FLUID COKING-STEAM CRACKING COMBINATION PROCESS

Guy B. Wirth, Florham Park, and Charles E. Jahnig, Rumson, N.J., assignors to Esso Research and Engineering Company

Filed Sept. 19, 1969, Ser. No. 859,313
Int. Cl. C10b *55/10*; C10g *37/02*
U.S. Cl. 208—54 **27 Claims**



This invention relates to a fluid coking-steam cracking furnace process combination for producing coke and gaseous hydrocarbons from a heavy hydrocarbon feedstock wherein the heat requirements for the endothermic-cracking reaction in the fluid coking vessel are supplied directly to the fluidized bed of hot carbonaceous particles. In one embodiment, steam is heated in a furnace, preferably a steam cracking furnace, and is thereafter passed into the fluid bed to supply all or essentially all the heat requirements for the cracking, i.e. coking reaction in the fluid bed. In another embodiment, steam is first heated in a furnace, preferably a steam cracking furnace. Thereafter, suitable oxygen-containing combustion gas mixtures, e.g. hydrogen-oxygen are employed to supply the remaining portion of the heat required to raise the temperature of the steam such that the steam, when introduced directly into the bottom of the fluid bed, in addition to fluidizing the bed, supplies the heat requirements for the coking reaction. In still another embodiment, the combustion products from suitable oxygen-containing combustion-gas mixtures, i.e. natural gas and oxygen, are injected directly into the upper portion of fluid bed such that the injection of the combustion products and steam from a steam cracking furnace into the fluid bed supply the heat requirement for the coking reaction directly to the bed. Additionally, the introduction of steam directly into the fluid bed provides the carrying and cracking medium for the vaporized hydrocarbons recovered from the fluid bed coking zone, which vaporized hydrocarbon-steam mixture is then passed through a steam cracking furnace to produce low molecular weight unsaturated products.

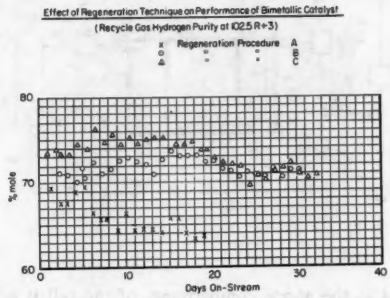
3,661,768

REFORMING WITH BIMETALLIC REFORMING CATALYST

Francis E. Davis, Jr., Woodbury, Walter R. Derr, Ashland, and Earle F. Ginter, Woodbury, N.J., assignors to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 23,160, Mar. 27, 1970. This application June 1, 1970, Ser. No. 42,171
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 **3 Claims**

The application describes an improved start-up procedure for bimetallic reforming catalyst comprising platinum which involves the steps of reducing the catalyst purged of oxygen with moisture saturated hydrogen gas until a temperature of 900° F. is attained thereafter sulfiding the reduced catalyst and charging naphtha in contact with the catalyst in the presence of circulating hydrogen gas provided with a sufficient amount of moisture and sulfur under operating conditions selected to assure generation of hydrogen rich gas.


Effect of Regeneration Technique on Performance of Bimetallic Catalyst
(Recycle Gas Hydrogen Purity at 102.5 R+3)
Regeneration Procedure
% mole
Days On-Stream

3,661,769

PROCESS FOR REFORMING A NAPHTHA FEEDSTOCK IN THE PRESENCE OF A PLATINUM-TUNGSTEN-ALUMINA CATALYST

Paul B. Venuto and Thaddeus E. Whyte, Jr., Cherry Hill, N.J., assignors to Mobil Oil Corporation

Filed Nov. 23, 1970, Ser. No. 91,971
Int. Cl. C10g *35/06, 35/08*
U.S. Cl. 208—139 **10 Claims**

A method for reforming a naphtha feedstock which comprises contacting the same with a catalyst that contains platinum and tungsten on a porous support.

3,661,770

CHLOROSILANE ACTIVATION OF AN ISOMERIZATION CATALYST AND PARAFFIN ISOMERIZATION UTILIZING THE SAME

Edwin N. Givens, Glassboro, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Oct. 22, 1970, Ser. No. 83,183
Int. Cl. B01j *11/78*; C07c *5/30*
U.S. Cl. 260—683.68 **8 Claims**

A Group VIII metal-alumina catalyst is pre-treated with a chlorosilane to produce a low temperature paraffin isomerization.

3,661,771

SEPARATION OF ORGANOSULFUR COMPOUNDS FROM HYDROCARBONS

Richard H. Havens, Kansas City, Mo., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed July 7, 1969, Ser. No. 839,709
Int. Cl. C10g *29/22*; C07c *9/00*
U.S. Cl. 208—240 **8 Claims**

Organosulfur compounds such as n-propylmercaptan, n-amylmercaptan, ethylsulfide, and methyl disulfide are removed from hydrocarbons, such as isooctane, by heating the hydrocarbon solution in contact with dimethylsulfate, cooling, and removing the dimethylsulfate.

3,661,772
SOLVENT REFINING OF NAPHTHENIC LUBE OIL WITH N-METHYL-2-PYRROLIDONE

Avilino Sequeira, Jr., and James P. Jolly, Nederland, Tex., and William E. Rea, Hopewell Junction, N.Y., assignors to Texaco Inc., New York, N.Y.

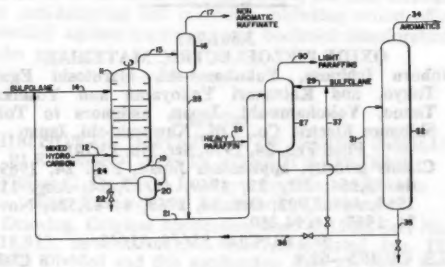
No Drawing. Filed Apr. 3, 1970, Ser. No. 25,592
Int. Cl. C10g *29/00*
U.S. Cl. 208—289 2 Claims

Manufacture of naphthenic lubricating oil product by distillation of crude oil containing naphthenic lubricating oil effecting separation of the naphthenic lubricating oil stocks; refining lubricating oil stocks for removal of constituents of low viscosity index, low thermal stability, and poor oxidation stability by solvent extraction with an aqueous solvent phase comprising between about 85 and 98 wt. percent N-methyl-2-pyrrolidone and between about 2 and 15 wt. percent water at conditions effective to dissolve at least 10 vol. percent producing as a raffinate a refined lubricating stock of said lubricating oil stocks of improved viscosity index, thermal stability and oxidation stability.

3,661,773
FOAM PREVENTION IN EXTRACTIVE STRIPPING OF SULFOLANE SOLVENT EXTRACT

Frederik J. Zuiderweg and Hendrik J. Scheffer, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,727
Claims priority, application Netherlands, Dec. 24, 1968, 6818690
Int. Cl. C10g *21/28*
U.S. Cl. 208—321 5 Claims



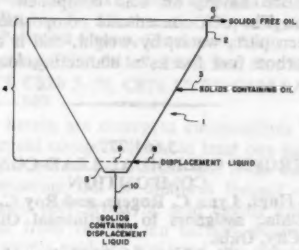
Gasoline boiling range aromatics are recovered from a sulfolane extract containing sulfolane, gasoline boiling range aromatics, and minor amounts of light paraffins by extractive stripping in the presence of added heavy paraffinic hydrocarbon to remove the light paraffins and fractionation to separate the aromatics and sulfolane.

3,661,774
SEPARATION OF SOLIDS FROM A LIQUID

George P. Masologites, Park Forest, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,756
Int. Cl. B01d *12/00*
U.S. Cl. 210—21 13 Claims

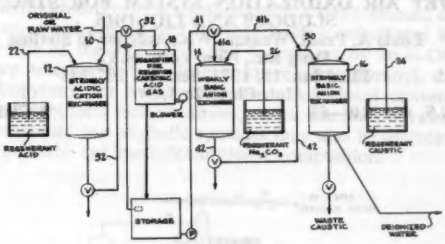
A method for separating solid particles from a liquid in which they are dispersed wherein the liquid is subjected to force conditions such as gravity settling, centrifugation, and the like to cause the solid particles to collect in a localized portion thereof, and introducing a displacement liquid into the localized portion under conditions such that the displacement liquid takes the place of at least part of the solids containing liquid in that localized portion, the displacement liquid taking up solid particles migrating into the localized portion, and removing displacement liquid having solid particles dispersed therein.



3,661,775
PROCESS FOR DEIONIZING WATER

Akimitsu Miyahara, Kawagoe, Minoru Fujita, Tokyo, Isao Yamamoto, Chiba, and Tamako Katamura, Tokyo, Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed July 1, 1970, Ser. No. 51,468
Int. Cl. C02b *1/68*
U.S. Cl. 210—37 4 Claims



This invention involves a 3-bed ion exchange water deionization system. The first bed contains a strongly acidic cation exchange resin; the second bed contains a weakly basic anion exchange resin; and the third bed contains a strongly basic anion exchange resin. Water to be deionized is passed down through the first column. The effluent is divided into two parts, the major portion being made to pass down through the second or weakly basic resin and, eventually, through the third column containing the strongly basic resin. The minor portion of the effluent from the cation exchange bed is mixed together with the effluent from the weakly basic resin bed and then sent down through the strongly basic resin bed. The effluent from the third column or strongly basic resin bed is the deionized water.

3,661,776
COMPOSITION COMPRISING A FOAM-FORMING FLUOROALIPHATIC COMPOUND AND A FILM-FORMING FLUOROALIPHATIC COMPOUND

Robert B. Fletcher, Maplewood, and Kenneth W. Livermore, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation of application Ser. No. 700,716, Jan. 26, 1968. This application Aug. 24, 1970, Ser. No. 66,595
Int. Cl. A62d *1/00*
U.S. Cl. 252—3 4 Claims

An aqueous composition for extinguishing or preventing flammable fuel fires is formulated as a 6% concentrate composition and comprises water, a water-soluble

foam-forming fluoroaliphatic compound and at least one water-soluble film-forming two-component fluoroaliphatic salt, viz, one having an acid component and a base component. The 6% concentrate composition is diluted with sixteen parts water, by weight, and is applied onto a hydrocarbon fuel fire as a blanketing foam.

3,661,777

THIXOTROPIC COLLOIDAL LEAD-CONTAINING COMPOSITION

Mack W. Hunt, Lynn C. Rogers, and Roy C. Sias, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,605
Int. Cl. C10m *5/22*
U.S. Cl. 252—33 24 Claims

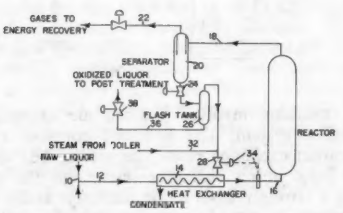
Thixotropic colloidal dispersions of lead oxide are disclosed broadly. These materials are prepared by treating a fluid, overbased lead dispersion with an active hydrogen compound (e.g. water or water-alcohol mixtures). Preferably, yellow lead oxide is used to prepare the fluid, overbased lead dispersion. The thixotropic colloidal dispersion of lead oxide is useful as a corrosion inhibitor and as a grease.

3,661,778

WET AIR OXIDIZATION SYSTEM FOR STRONG SLUDGES AND LIQUORS

Louis A. Pradt, Wausau, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,393
Int. Cl. C02c *5/04*
U.S. Cl. 210—63 3 Claims



Raw liquor is introduced to a heat exchanger and thence through a temperature control valve to a reactor and thence to a separator, and a flash tank is provided which receives oxidized liquor from the separator at an intermediate pressure resulting in "flash" steam used for preheating in the heat exchanger.

3,661,779

GREASES CONTAINING PARTICULATE POLYMERIC DIIMIDE THICKENERS

Garth M. Stanton, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Aug. 1, 1969, Ser. No. 846,941
Int. Cl. C10m *5/20*
U.S. Cl. 252—49.6 13 Claims

Grease compositions are disclosed comprising a lubricating fluid and a thickener consisting essentially of a polymeric diimide having a number average molecular weight of 10,000 to 50,000, with the thickener comprising 5 to 40 weight percent of the grease composition and being dispersed in the grease as particles less than five microns in diameter. Derivatives of pyromellitic dianhydride are particularly preferred.

3,661,780

HYDROCARBON COMPOSITION CONTAINING POLYALKYL-SUBSTITUTED TETRAHYDRONAPHTHALENES AND DI-n-C_{10}-C_{15}-ALKARYL HYDROCARBONS AND PROCESS FOR PREPARING SAME

George C. Feighner, Franklin Lakes, N.J., and Oliver C. Kerfoot, Delmar D. Krehbiel, and Gene E. Nicks, Ponco City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Continuation-in-part of application Ser. No. 716,351, Mar. 27, 1968, which is a continuation-in-part of application Ser. No. 643,370, June 5, 1967, both now abandoned. This application Oct. 26, 1970, Ser. No. 84,125
Int. Cl. C10m *1/16*
U.S. Cl. 252—59 11 Claims

Hydrocarbon composition containing at least 20 volume percent polyalkyl-substituted tetrahydronaphthalenes and from 25 to 60 volume percent di-n-C_{10}-C_{15}-alkaryls, each of said tetrahydronaphthalenes and said di-n-C_{10}-C_{15}-alkaryls containing from 26 to 36 carbon atoms. Process for preparing said hydrocarbon composition, wherein the process comprises (1) contacting an admixture of mono-n-C_{10}-C_{15}-alkaryls and alkyl-substituted tetrahydronaphthalenes with a Friedel-Crafts catalyst, and (2) fractionally distilling the reaction mass to recover the desired hydrocarbon composition. The hydrocarbon composition is suitable for use both as a feedstock for preparing oil-soluble sulfonic acids and as a lubricant, particularly a lubricant for low-temperature ambient conditions.

3,661,781

OXIDE PIEZOELECTRIC MATERIAL

Noboru Ichinose, Yokohama-shi, Harutoshi Egami, Tokyo, and Katsunori Yokoyama and Yoshikazu Tanno, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 24, 1970, Ser. No. 13,741
Claims priority, application Japan, Feb. 24, 1969, 44/13,164; July 22, 1969, 44/57,424; Aug. 11, 1969, 44/62,902; Oct. 14, 1969, 44/81,526; Nov. 26, 1969, 44/94,250
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 6 Claims

An oxide piezoelectric material essentially consisting of 50.0 to 1.0 mol percent of $Pb(Cd_{1/3}\cdot Nb_{2/3})O_3$, 34.0 to 55.5 mol percent of $PbTiO_3$ and 16.0 to 53.3 mol percent of $PbZrO_3$ assuming the form of solid solution. The material may further contain at least one of MnO_2, Cr_2O_3, NiO, CoO, La_2O_3, Bi_2O_3, ThO_2 and CeO_2.

3,661,782

HYDRAULIC BRAKE FLUID BASE OILS

Malcolm K. Smith, Westfield, N.J., assignor to The Baker Castor Oil Company, Bayonne, N.J.

No Drawing. Application Feb. 27, 1962, Ser. No. 176,126, which is a continuation-in-part of application Ser. No. 690,417, Oct. 16, 1957, which in turn is a continuation-in-part of application Ser. No. 629,585, Dec. 3, 1956. Divided and this application Aug. 24, 1970, Ser. No. 66,554
Int. Cl. C09k *3/00*
U.S. Cl. 252—79 5 Claims

Novel hydraulic brake fluids wherein the base oils are an adduct of a mixture of ethylene oxide and 1,2-propylene oxide with castor oil, and are characterized by having greatly improved properties, in connection with their use in brake fluids, over the properties of castor oil alone or in combination with either ethylene oxide or 1,2-propylene oxide.

3,661,783

COMPOSITION FOR METAL PLATING OF PLASTICS

William J. Cooper, Butler, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

No Drawing. Original application June 2, 1967, Ser. No. 643,053, now Patent No. 3,507,681, dated Apr. 21, 1970. Divided and this application Jan. 29, 1970, Ser. No. 6,947

Int. Cl. C23f *17/00;* C09k *3/00*

U.S. Cl. 252—79.2 3 Claims

Plastic surfaces are prepared to make them susceptible to being plated by chemical plating solutions by treatment with a solution of a noble metal salt, for example, palladium chloride, in an acid etchant for the plastic, followed by treatment with a solution containing amine boranes or ammonia borane. The borane solution may be a chemical plating solution, in which case, the second step of the surface preparation and the plating occurs simultaneously.

3,661,784

METHOD OF PROTECTING METAL SURFACES AGAINST ABRASIVE WEAR IN SUBMERSIBLE PUMPS

Thomas J. Bellos, Kirkwood, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,403

Int. Cl. C10m *1/24, 1/32, 3/04*

U.S. Cl. 252—49.3 3 Claims

Solutions of water soluble and/or dispersible oxyalkylated quaternary fatty amines not only offer protection against abrasive wear to submerged metal surfaces, such as in submersible oil well pumps, but also through their anti-bacterial and corrosion inhibiting action offer protection against corrosion and bacterial deterioration of the pump.

3,661,785

INHIBITION OF DEPOSITION OF WATER INSOLUBLE COMPOUNDS IN AQUEOUS SYSTEMS

William G. De Pierri, Jr., Baytown, Tex., assignor to Esso Research and Engineering Company

No Drawing. Original application Apr. 4, 1968, Ser. No. 718,913, now Patent No. 3,557,164, dated Jan. 19, 1971. Divided and this application Apr. 27, 1970, Ser. No. 43,259

Int. Cl. C02b *5/06*

U.S. Cl. 252—8.55 B 4 Claims

Deposition of water insoluble compounds from aqueous systems containing them is inhibited by adding to the aqueous system, which may be a subsurface formation water or brine, a small but effective amount of a phosphate ester of ethoxylated esterified triol or the alkali metal or ammonium salts thereof.

3,661,786

DETERGENT COMPOSITIONS CONTAINING STABILIZED α-AMYLASE

Malcolm Desforges, Newcastle-upon-Tyne, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,290

Int. Cl. C11d *7/18, 7/56*

U.S. Cl. 252—99 11 Claims

A granular detergent composition is provided containing a mixture of an organic detergent and an alkaline builder, an α-amylase, and an amount of starch sufficient to stabilize the α-amylase.

3,661,787

SATURATED ALIPHATIC DICARBOXYLIC ACID SALTS AS DETERGENT BUILDERS

George E. Brown, Jr., Cincinnati, Ohio, assignor to The Pollutrol Group, Cincinnati, Ohio

No Drawing. Filed Oct. 9, 1970, Ser. No. 79,691

Int. Cl. C02b *5/06;* C07c *55/02;* C11d *9/26*

U.S. Cl. 252—109 2 Claims

Disclosed herein are detergent compositions which include a detergent compound and at least one builder salt. The major portion of the builder salt is an alkali metal salt, an ammonium salt or mixtures thereof of an aliphatic saturated polycarboxylic acid having a linear carbon chain of from two to ten carbon atoms. Salts of oxalic and succinic acid are preferred. No polyphosphates are required.

3,661,788

STABILIZATION OF METHYLCHLOROFORM

Alastair Campbell, Peter Robinson, and James William Tipping, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed July 28, 1969, Ser. No. 845,522

Claims priority, application Great Britain, Aug. 30, 1968, 41,494/68

Int. Cl. C11d *7/50;* C23g *5/02*

U.S. Cl. 252—171 9 Claims

Methylchloroform is stabilized with a small amount of pyran, dihydropyran and tetrahydropyran, substituted in any one of the 2, 3, 4, 5, and 6 positions by an —OR group wherein R is hydrogen, lower alkyl, pyranyl, dihydropyranyl, or tetrahydropyranyl. Additional conventional stabilizers such as nitriles, ethers, alcohols, nitrates, nitroalkanes and aliphatic epoxides may also be included in the stabilized methylchloroform composition.

3,661,789

STABILIZED OXYGEN BLEACH-ACTIVATOR SYSTEM

Garland G. Corey, Milltown, and Bernard Weinstein, Plainfield, N.J., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 843,829, July 22, 1969. This application Nov. 24, 1969, Ser. No. 879,573

Int. Cl. C01b *15/00;* C11d *7/51*

U.S. Cl. 252—186 5 Claims

Oxygen releasing bleaches such as perborates are combined with activators and nonionic surfactants or glycols to provide compositions unusually stable upon storage under adverse conditions of high temperature and humidity to which they are normally subjected.

3,661,790

GLOWING BOUNCING PUTTY

Hubert William Dean, North Branford, and Almon G. Hovey, Northford, Conn. (both % Arnold Clark, Incorporated, P.O. Box 741, New Haven, Conn. 06520)

No Drawing. Continuation-in-part of application Ser. No. 788,347, Dec. 31, 1968. This application Oct. 20, 1969, Ser. No. 867,872

Int. Cl. C09k *1/00;* A63b *43/06*

U.S. Cl. 252—301.3 R 9 Claims

A non-toxic novelty composition comprising various components, including a "bouncing putty," possessing unusual properties, particularly the ability to glow in the dark after exposure to a light source.

3,661,791

METHOD OF PREPARING RARE EARTH METAL PHOSPHATE VANADATE LUMINESCENT COMPOSITIONS HAVING ACICULAR CRYSTAL HABIT

Richard C. Ropp, Warren, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1970, Ser. No. 3,403
Int. Cl. C09k *1/36, 1/44*
U.S. Cl. 252—301.4 P 10 Claims

Separately precipitated rare-earth metal orthophosphate and separately precipitated rare-earth metal orthovanadate are admixed and fired to form a solid solution phosphor composition exhibiting a unique acicular crystal habit. The compositions are particularly useful for high pressure mercury vapor lamps. This method utilizing separately precipitated orthophosphate and orthovanadate results in a very homogeneous solid solution of these compositions exhibiting superior luminescence.

3,661,792

INCREASING THE PARTICLE SIZE OF PRECIPITATED HALOPHOSPHATE PHOSPHORS WITH THE AID OF SEED MATERIAL

Hugh C. Bertsch and Michael E. Russo, St. Louis, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed June 5, 1970, Ser. No. 43,972
Int. Cl. C01b *25/32;* C09k *1/36*
U.S. Cl. 252—301.4 P 7 Claims

The particle size of precipitated alkaline earth haloapatites is increased by carrying out the precipitation in the presence of a suitable seed material. The seed material is preferably a precipitated alkaline earth haloapatite substantially all of whose particles are of a size between about 1 and 4 microns. Before use, the seed material is dried at a temperature not exceeding its softening point, conveniently about 125° C. Precipitation at a temperature above about 50° C. in the presence of such a seed material yields a granular precipitate whose particles are of a size substantially within the preferred 3 to 30 micron range.

3,661,793

DEFOAMING COMPOSITION AND A METHOD FOR ITS USE

Gerald B. Curtis, Haddonfield, N.J., assignor to Pioneer Chemical Works, Inc., Philadelphia, Pa.

No Drawing. Filed Aug. 22, 1969, Ser. No. 852,477
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 5 Claims

A composition is set forth comprising, by weight based on the composition, about 75% to about 97% of a water-insoluble hydrophobic organic liquid, about 3% to about 20% of normally hydrophilic perlite having a hydrophobic surface, 0% to about 5% of a surfactant, 0% to about 5% of hydrophobic silica and 0% to about 5% of a suspension aid. This composition is valuable in controlling foaming in an aqueous system.

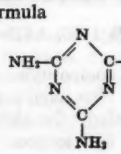
3,661,794

SURFACTANT COMPOSITION

Alois Aignesberger, Trostberg, Upper Bavaria, Germany, assignor to Suddeutsche Kalkstickstoff-Werke AG, Trostberg, Upper Bavaria, Germany

No Drawing. Filed Feb. 9, 1970, Ser. No. 9,967
Claims priority, application Germany, Feb. 13, 1969, P 19 07 261.8
Int. Cl. B01f *17/06, 17/32, 17/34*
U.S. Cl. 252—354 7 Claims

Water soluble resins obtained by condensing amino-s-triazines of the formula



wherein R is H, NH_2, OH, or C_nH_{2n+1}, *n* being an integer between 1 and 9, with lower alkanals or alkanones in the presence of sulfites to make the resins anionic have only negligible effects on the surface tension of water. Yet they synergistically cooperate with all ordinary anionic organic surfactants in sharply lowering the surface tension of water below that obtained by the surfactants alone. Some of the resins stabilize stock solutions of perfluorinated anionic surfactants.

3,661,795

PHOSPHATIDE EMULSIFIERS

Hermann Pardun, Cleves, Germany, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Jan. 8, 1970, Ser. No. 1,558
Claims priority, application Germany, Jan. 9, 1969, P 19 00 961.1
Int. Cl. B01f *17/30*
U.S. Cl. 252—356 5 Claims

An emulsifying agent suitable for use in margarine and preparable as dry flakes or pellets comprises from 10 to 50 parts by weight of a partially hydrolysed vegetable phosphatide having a lysophosphatide content of from 2 to 15% by weight of the dry phosphatide, and from 90 to 50 parts by weight of a saturated fatty acid mono/diglyceride having a monoglyceride content of from 35 to 90% by weight.

3,661,796

PREVENTION OF CORROSION ON ALUMINUM METAL AND ITS ALLOYS

William A. Erby and Paul W. Thorsell, Downers Grove, and Perlita A. Ilagan, Chicago, Ill., assignors to Daubert Chemical Company, Oak Brook, Ill.

No Drawing. Filed May 5, 1970, Ser. No. 34,860
Int. Cl. C23f *11/14*
U.S. Cl. 252—392 10 Claims

Compositions for, and a method of, preventing the oxidation and/or pitting of the surface of aluminum metal and aluminum metal alloys, the compositions comprising as their essential active ingredient a morpholine salt of a C_5–C_{22} monocarboxylic or fatty acid exemplified by morpholine caprylate. The morpoline salt advantageously is utilized in conjunction with an aluminum metal lubricant such as a mineral oil, the concentration of the salt in the lubricant being about 0.1% to about 99%, by weight.

3,661,797

ANALYTICAL REAGENTS FOR QUANTITATIVE DETERMINATION OF WATER

Clifton E. Meloan, Manhattan, Kans., and Thomas G. Bunting, Willoughby, Ohio, assignors to Kansas State University Research Foundation, Manhattan, Kans.

No Drawing. Filed June 10, 1970, Ser. No. 45,253
Int. Cl. G01n *33/18*
U.S. Cl. 252—408 26 Claims

Under anhydrous conditions cobalt, nickel, and iron salts react with aromatic diazole compounds, such as piaselenole and piasthiole, to produce complexes which are capable of decomposing reproducibly in the presence of water, and are therefore useful as analytical reagents for water determinations. The sensitivity of the compounds varies with the element in the heterocyclic ring, namely selenium or sulfur, which complexes with the cobalt, nickel, or iron salt. Sensitivity can be further varied by employing the complex in admixture with a water reactive compound, such as cobaltous chloride or nitrate. Depending on the reagent or reagent mixture selected, water determinations in the range of p.p.b. through p.p.m. to a few percent can be made, using a spectro-photometer. Interferences are limited.

3,661,798

PROCESS FOR REGENERATING NICKEL AND COBALT HYDROGENATION CATALYSTS

Jean Cosyns, Nanterre, and Pierre Duhaut, Le Vesinet, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, Hauts-de-Seine, France

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,527
Claims priority, application France, Apr. 18, 1969, 6912376
Int. Cl. B01j *11/30, 11/02*
U.S. Cl. 252—416 15 Claims

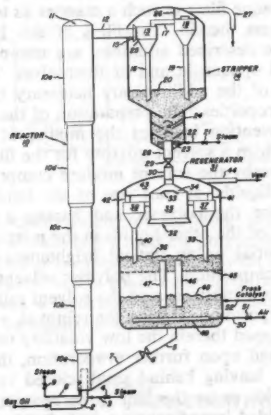
In the hydrogenation of aromatic and olefinic hydrocarbons containing about 1–200 parts per million by weight of sulfur, nickel and cobalt catalysts are deactivated and are difficult to regenerate. If, however, a silica carrier is employed, the regeneration of the catalysts can be accomplished by the successive steps of heating the deactivated catalysts with a gas containing molecular oxygen at 300–600° C., contacting resultant cooled catalysts with liquid water at about 0–250° C. and then with hydrogen at 200–500° C. This regeneration process does not work satisfactorily with alumina as a carrier.

3,661,799

OXIDATIVE FLUIDIZED REGENERATION OF PETROLEUM CONVERSION CATALYST IN SEPARATE DILUTE AND DENSE PHASE ZONES

Robert R. Cartmell, Crown Point, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Jan. 26, 1970, Ser. No. 5,777
Int. Cl. B01j *11/04, 11/74*
U.S. Cl. 252—417 7 Claims



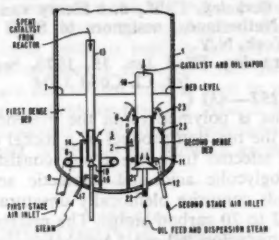
Catalytic conversion of petroleum feedstocks, such as the cracking of a gas oil in a vertical transport reactor, is improved by effecting rapid separation of catalyst from reactor effluent and regenerating catalyst in a multi-stage fluid-bed system. A higher yield of desirable petroleum products and a lower carbon level on spent catalyst are realized. Partial regeneration of spent catalyst is effected in a first dilute-phase regeneration stage, permitting subsequent use of a high regeneration temperature in order to reach an acceptably low carbon level on regenerated catalyst without harm to sensitive conversion catalysts.

3,661,800

STAGED FLUIDIZED SOLIDS CONTACTING PROCESS IN OXIDATION REGENERATION OF CATALYSTS

Robert W. Pfeiffer, Bronxville, and Henry P. Wickham, Upper Brookville, Glen Head, N.Y., assignors to Pullman Incorporated, Chicago, Ill.

Filed June 17, 1970, Ser. No. 46,985
Int. Cl. B01j *11/04, 11/68*
U.S. Cl. 252—417 9 Claims



A method for staged regeneration of particulate, fluidized material in a unitary vessel having superimposed beds wherein regeneration gas leaving a second stage is passed through a first stage. The method is particularly applicable to the regeneration of hydrocarbon cracking catalyst to low residual levels of carbon.

3,661,801

SOLID PHOSPHORIC ACID CATALYSTS

William R. Gutmann and Edward K. Dienes, Louisville, Ky., assignors to Catalysts and Chemicals Inc., Louisville, Ky.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,025
Int. Cl. B01j *11/82*
U.S. Cl. 252—435 5 Claims

Solid phosphoric acid is the name which has come into use for a calcined mixture of an acid of phosphorous and a porous siliceous material. Solid phosphoric acid catalysts have for years been virtually the only catalyst effective in many reactions involving olefins, particularly the polymerization of olefins to form high octane fuels. These catalysts are widely used despite their lack of strength and poor wearing qualities. High strength solid phosphoric acid catalysts are provided herein, the uniqueness of the catalyst being attributable to the method of preparation. P_2O_5 is dry blended with the silica material to form the precursor. The precursor is then subjected to a steam-air treatment to bring about the hydration of the P_2O_5. This forms a silico-phosphorous matrix. This matrix is preserved by not physically changing the catalyst during its preparation. This is accomplished by forming spheres of the catalyst material by tumbling and spraying the tuming mass with phosphoric acid.

3,661,802

POLYMERIZATION CATALYSTS USING SUPPORTED RHENIUM OXIDES

Philip E. Nicpon, Hammond, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 31, 1970, Ser. No. 68,197
Int. Cl. C08f *1/52*
U.S. Cl. 252—430 7 Claims

A composition of matter useful as a catalyst for the polymerization of mono- and diolefins to normally solid polymers which comprises a minor amount of a higher oxide of rhenium supported on a major amount of a high-surface-area silica, said oxide in combination with said silica, wherein said combination has been heated in the temperature range from about 400° C. to about 950° C., and a promoter chosen from the group containing compounds of formula R_3Al wherein R is a lower alkyl group

of from 1 to about 6 carbon atoms and wherein the mole ratio of said promoter to said higher oxide of rhenium runs from about 0.5 to about 50.

3,661,803

ETHYLENE POLYMERIZATION IN THE PRESENCE OF COMPLEX NICKEL CATALYSTS CONTAINING A GLYCOLIC ACID, THIOGLYCOLIC, OR THIOLACTIC ACID LIGAND

Ronald Bauer, Orinda, and Harold Chung and Wilhelm Keim, Berkeley, Calif., and Henry van Zwet, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,199
Int. Cl. C08d *3/04*
U.S. Cl. 252—431 C 11 Claims

Ethylene is polymerized in the presence of a catalyst which is the reaction product of a nickel compound with a ligand selected from the group consisting of glycolic acid, thioglycolic acid and thiolactic acid. The nickel compounds comprise olefinically unsaturated compounds of from 2 to 20 carbon atoms. The preferred nickel compound is biscyclooctadiene-1,5-nickel.

3,661,804

LEAD DIOXIDE STABILIZATION

Klaus L. J. Scholz, Konigsbrunn, and Josef Psader, Neusass, Germany, assignors to Polychemie G.m.b.H. Augsburg, Augsburg, Germany

No Drawing. Filed Apr. 3, 1970, Ser. No. 25,569
Claims priority, application Germany, Apr. 18, 1969, P 19 19 803.9
Int. Cl. B01j *11/78*
U.S. Cl. 252—441 5 Claims

Stabilization of the oxidizing capacity of lead dioxide to prevent acceleration thereof caused by heat which is obtained by the addition of 0.1 to 15% by weight, based on the lead dioxide, of a multivalent metal salt wherein the metal is tin, zinc, cadmium, nickel, cobalt, manganese, iron, chromium, bismuth, vanadium, tungsten or molybdenum.

3,661,805

METHOD OF MANUFACTURING AN EXTRUDED CATALYST COMPOSITION

Edward Horvath, Hickory Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,910
Int. Cl. B01j *11/32*
U.S. Cl. 252—465 9 Claims

A method for the manufacture of an extruded catalyst composition comprising a Group VI–B metal, a Group VIII metal and a refractory inorganic oxide gel. The Group VI–B and Group VIII metal components are combined with the refractory inorganic oxide gel, said gel being peptized before or after combination wtih the metallic components. The mixture is subsequently treated with an aqueous alkaline reagent to form an extrudable mass of finely divided particles. Upon extrusion, the extrudate is dried and oxidized.

3,661,806

EXHAUST GAS OXIDATION CATALYST AND PROCESS

Warren S. Briggs and Frank G. Ciapetta, Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 707,395, Feb. 23, 1968, which is a continuation-in-part of application Ser. No. 418,402, Dec. 15, 1964, which in turn is a continuation-in-part of application Ser. No. 298,164, July 29, 1963. This application Jan. 5, 1970, Ser. No. 808
Int. Cl. B01j *11/16, 11/24*
U.S. Cl. 252—470 3 Claims

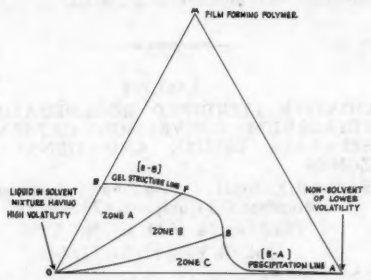
Internal combustion engine exhaust gas oxidation catalyst and process of treating the exhaust gases to remove air pollutants. The catalyst comprises oxidation promoters dispersed upon a matrix. The catalyst possesses a specific pore volume distribution wherein 0.20 to 0.35 cc./g. of its pore volume are in pores having a diameter below 120 A., 0.10 to 0.25 cc./g. are in pores having a diameter between 120–3500 A. and 0.35 to 0.60 cc./g. are in pores having a pore diameter greater than 3500 A. The total pore volume of the catalyst is 0.65 to 1.20 cc./g. This catalyst has been found to possess an unusually long activity life.

3,661,807

SOLUBLE FLUORESCENT MATERIALS AND OPTICAL BRIGHTENERS IN SOLVENT PRECIPITATION FILM COMPOSITIONS

Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 4,175, Jan. 14, 1970, which is a continuation of application Ser. No. 524,953, Feb. 1, 1966. This application Apr. 15, 1970, Ser. No. 28,734
Int. Cl. C08 *1/26*
U.S. Cl. 260—2.5 M 25 Claims



The disclosed invention relates to opaque films with enhanced optical properties produced by the inclusion of soluble fluorescent materials and optical brighteners in the opaque films in such a manner as to maximize their effectiveness therein. The films of this invention, absent the above described additives, are non-porous, microcellular and opaque in and of themselves. Therefore, lesser amounts of the additives are necessary to obtain desired optical properties. The preparation of the films of the disclosed invention involves the mixing of a film forming polymer with a solvent mixture for the film forming polymer, whereby the solvent mixture comprises at least two miscible liquids, at least one of the liquids being a non-solvent for the polymer and having a lower volatility than that of the other liquids in the mixture and a flouresecent material or an optical brightener which is soluble in said composition. The polymer solvent mixture is then applied to a substrate and the solvent mixture is removed as by evaporation. During the removal, a gelled film having entrapped therein the low volatility non-solvent is first formed and upon further evaporation, the non-solvent is removed, leaving behind small closed voids in its place. These voids cause the film to be opaque.

The added ingredients are included by dissolving them in the solvent mixture of the above-described process prior to the removal of the solvent mixture from the composition.

3,661,808

CATALYST COMBINATION FOR POLYURETHANES

William Alvis Kennedy, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed July 31, 1970, Ser. No. 60,155
Int. Cl. C08g *22/38, 22/44*
U.S. Cl. 260—2.5 AC 7 Claims

An excellent catalyst for polyurethanes is a combination of 4,4'-dimorpholinodiethyl ether and 1,4-dimethyl-

piperazine. The catalyst combination, which exhibits a much lower vapor pressure than dimethyl piperazine alone, is useful in polyether and polyester foams. Urethane foams are useful in various applications ranging from cushioning in flexibles to insulation in rigids.

3,661,809

FLAME RETARDANT POLYURETHANE FOAM

James J. Pitts, Wallingford, Conn., assignor to Olin Corporation

No Drawing. Filed Aug. 28, 1970, Ser. No. 67,983
Int. Cl. C08g *22/44, 51/56*
U.S. Cl. 260—2.5 AJ 22 Claims

Certain metal ammine complexes are utiilzed as flame-retardant additives for polyurethane foam.

3,661,810

NONCLUMPING THERMOPLASTIC PARTICLES AND PROCESS OF MAKING SAME

Herbert Gahmig, Princeton, N.J., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed June 17, 1970, Ser. No. 47,176
Int. Cl. C08j *1/26, 1/30*
U.S. Cl. 260—2.5 B 8 Claims

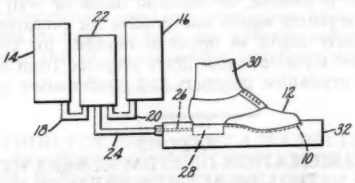
Clumping of thermoplastic particles is prevented by mixing the particles with finely divided hydrophobic silica powder. The mixture retains its free-flowing characteristics during storage.

3,661,811

COMPOSITIONS FOR MOLDING POLYURETHANE FOAM ARTICLES

Alan Hardy, David T. Messenger, and Austin T. Carpenter, Leicester, England, assignors to USM Corporation, Flemington, N.J.

Filed Sept. 9, 1970, Ser. No. 70,801
Claims priority, application Great Britain, Oct. 4, 1969, 48,850/69
Int. Cl. C08g *22/16, 22/44*
U.S. Cl. 260—2.5 AN 8 Claims



Process and composition for molding polyurethane foam articles, particularly for molding polyurethane foam outsoles in which a diisocyanate is reacted with a hydroxyl terminated polyester and a chain extender mixture of an aliphatic diol and a hydroxyl terminated adduct of diisocyanate and an aliphatic diol.

3,661,812

PRODUCTION OF FREE-FLOWING AMINOPLAST FOAMS

Anton Buchner and Hans Lang, Limburgerhof, Johann Lenz, Ludwigshafen, Leo Unterstenhoefer, Limburgerhof, and Wilhelm Krieger, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,279
Claims priority, application Germany, Dec. 4, 1969, P 19 60 810.7
Int. Cl. C08j *1/16*
U.S. Cl. 260—2.5 F 3 Claims

A process for improving the flowability of aminoplast foams prior to curing, particularly for covering soil, by incorporating coarse gas bubbles into foam containing fine bubbles.

3,661,813

POLYOLEFIN FOAM UTILIZING POLYMERIZATION DEACTIVATED CATALYST AND SOLVENT AS NUCLEATING AGENT AND BLOWING AGENT, RESPECTIVELY

Edward W. Cronin, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Mar. 26, 1969, Ser. No. 810,793
Int. Cl. C08f *47/10, 29/04, 1/28*
U.S. Cl. 260—2.5 HA 12 Claims

There is provided a foamed polyolefin product and process for the production thereof. After polymerization of the olefin by a low pressure process, the organometallic containing catalysts used in the polymerization process are not completely removed from the polymer. The catalysts are deactivated and, at least in part, function as nucleating agent for foaming. Also, a part of the polymerization solvent is left in the polyolefin and may function, at least in part, as the blowing agent.

3,661,814

PHENOL-FORMALDEHYDE ADHESIVE RESINS BY ADDITION OF POLYHYDRIC ALCOHOLS

Harry A. Smith and Erwin H. Kobel, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,503
Int. Cl. C08g *5/06, 5/18, 51/04*
U.S. Cl. 260—17.2 10 Claims

Improved phenol-formaldehyde adhesive resins are obtained by premixing with aqueous formaldehyde about 0.5–10 weight percent based on formaldehyde of a polyhydric alcohol of Formula I:

$$R\{(OC_mH_{2m})_aOH)_b$$

where R is a C_4–C_{12} aliphatic group, m is 2–4, a is 0–3 and b is 4–8, and thereafter reacting the formaldehyde-polyhydric alcohol solution with phenol in the presence of alkali. Preferred are water-soluble sugars and related polyols including their C_2–C_4 alkylene oxide derivatives. The resulting thermosetting resole adhesive resins are particularly suitable for plywood glues.

3,661,815

WATER-ABSORBING ALKALI METAL CARBOXYLATE SALTS OF STARCH-POLYACRYLONITRILE GRAFT COPOLYMERS

Theodore Smith, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

No Drawing. Filed May 18, 1970, Ser. No. 38,388
Int. Cl. C08b *25/02;* C08f *3/76, 27/14*
U.S. Cl. 260—17.4 12 Claims

Granular, water-insoluble alkali metal carboxylate salts of starch-acrylonitrile graft copolymers which are produced by saponifying starch-acrylonitrile graft copolymers with a base in an aqueous alcoholic medium.

3,661,816

ROOM TEMPERATURE CURING ORGANOPOLYSILOXANES

Anthony Enrico Pepe, Wilton, Conn., and Guenther Fritz Lengnick, Manitou Beach, and Charles George Neuroth, Blissfield, Mich., assignors to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

No Drawing. Continuation-in-part of application Ser. No. 688,336, Dec. 6, 1967. This application Apr. 10, 1970, Ser. No. 27,453
Int. Cl. C08h *9/00*
U.S. Cl. 260—18 S 5 Claims

The invention relates to curable organopolysiloxane compositions comprising an organopolysiloxane and a disilaorganic cross-linking agent containing functional groups which are hydrolyzable in the presence of ambient moisture.

3,661,817
CURABLE COMPOSITIONS
Stephen B. Hamilton, Schenectady, Melvin D. Beers, Ballston Lake, and Abe Berger and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company, New York, N.Y.
No Drawing. Filed May 4, 1970, Ser. No. 34,576
Int. Cl. C08h *9/00*
U.S. Cl. 260—18 S **46 Claims**

Room temperature vulcanizing silicone elastomers are prepared by the addition of a novel cross-linking agent such as acetoxypropenylenyltriacetoxysilane to a silanol chain-stopped polydiorganosiloxane fluid. These compositions are stable, free flowing fluids in the absence of moisture but cure to a rubbery, solid elastic state upon exposure to moisture. These compositions are particularly useful as adhesives in difficult bonding situations such as attaching glass window panes to aluminum window frames.

3,661,818
METHOD FOR PREPARING AND COMPOSITIONS OF VINYLIZED AND/OR VINYLIDENIZED EPOXY RESIN ESTERS
Rolf Guldenpfennig, Bammental, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany
No Drawing. Continuation-in-part of application Ser. No. 704,994, Feb. 13, 1968. This application Apr. 12, 1971, Ser. No. 133,333
Claims priority, application Germany, Feb. 22, 1967, R 45,344
The portion of the term of the patent subsequent to Feb. 16, 1988, has been disclaimed
Int. Cl. C08g *5/20*
U.S. Cl. 260—19 EP **11 Claims**

Methods and compositions for water-dilutable heat-curable coatings comprising:

(I) Vinylized and/or vinylidenized compounds of partial esters containing hydroxyl groups and optionally also epoxide groups obtained by partial esterification of compounds containing epoxide groups and optionally hydroxyl groups with monocarboxylic acid mixtures having a predominant content of unsaturated aliphatic straight chain monocarboxylic acids and/or partial esters reacted with polybasic carboxylic acids in such a way that the resulting epoxide resin esters containing free carboxyl groups and free hydroxyl groups acquire the ability to be diluted with water by neutralization with ammonia or strong organic nitrogen bases in the presence of water;

(II) Ammonia or strong organic nitrogen bases;

(III) Water; and

(IV) heat-curable, water-soluble or hydrophilic low molecular weight aldehyde condensation products of:

(a) phenolic resols;

(b) resins which form aminoplasts; and

(c) etherified phenolic resols.

3,661,819
AQUEOUS COATING FOR USE IN ELECTRODEPOSITIONS CONTAINING FULLY ETHERIFIED POLYMETHYLOL AMINOTRIAZINE CROSS-LINKING AGENTS
Jerry Norman Koral, Stamford, and Michael Petschel, Jr., Wilton, Conn., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Sept. 21, 1970, Ser. No. 74,107
Int. Cl. C08g *9/30*
U.S. Cl. 260—21 **10 Claims**

An aqueous dispersion of a mixture of certain alkylated fully methylolated aminotriazines such as melamine and benzoguanamine in a mixture with certain water-dispersible, nongelled, polymeric materials carrying an anionic charge, which polymerci material contains at least one class of reactive groups selected from the group consisting of carboxyl groups, alcoholic hydroxy groups and amide groups. The invention further relates to the use of such aqueous dispersions in the electrodeposition of aqueous coatings on metallic surfaces.

3,661,820
COATING COMPOSITION FOR PREVENTING CARBURIZATION OF STEEL PARTS WITH SUBSEQUENT WATER WASH-OFF CAPACITY
Robert W. Foreman, Bloomfield Hills, and Jon S. Pontius, Ypsilanti, Mich., assignors to Park Chemical Company
No Drawing. Filed July 15, 1970, Ser. No. 55,225
Int. Cl. C09d *5/02;* **C21d** *1/70;* **C23c** *9/06*
U.S. Cl. 260—22 A **8 Claims**

A composition for use in forming a coating on selected surfaces of steel parts to selectively prevent carburization thereof in gas carburizing, pack carburizing, and carbonitriding mediums, said composition being basically comprised of a water reducible or water soluble organic resin, a boron material such as boric acid, and a carrier fluid of water.

3,661,821
RESINOUS CONDENSATION PRODUCTS AND METHOD OF PREPARING SAME
Cornelio Caldo and Giuseppe Cantatore, Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy
No Drawing. Continuation of application Ser. No. 506,016, Nov. 1, 1965, which is a continuation-in-part of abandoned application Ser. No. 30,732, May 23, 1960. This application May 15, 1970, Ser. No. 37,448
Claims priority, application Italy, May 26, 1969, Pat. No. 611,258; Dec. 10, 1959, Pat. No. 643,990; Feb. 22, 1960, Pat. No. 682,346, Oct. 22, 1959, Pat. No. 623,526
Int. Cl. C08f *25/12*
U.S. Cl. 260—23 EP **6 Claims**

New condensation products comprising amine-epichlorhydrin condensates modified by further reaction with aliphatic polyamine, or aliphatic imine or with alkylating or arylating agents and process for preparing same. Particularly useful as tinctorial modifier for crystalline polymers. Dyeable textile fibers prepared from composition of crystalline polymers and condensation products.

3,661,822
STABILIZATION OF EPDM RUBBER WITH EPOXIDE-SULFIDE MIXTURE
Charles W. Lee, Towaco, N.J., assignor to Uniroyal, Inc., New York, N.Y.
No Drawing. Filed Apr. 30, 1970, Ser. No. 33,479
Int. Cl. C08f *29/10, 45/58*
U.S. Cl. 260—23.5 **18 Claims**

Stabilization of ethylene-propylene-non - conjugated diene terpolymer (EPDM) elastomers against heat aging by incorporation of an epoxide and an organic sulfide (e.g., an olefin oxide and n-octyl disulfide).

3,661,823
POLYFLUOROHYDROCARBON RESIN COMPOSITIONS AS CUSHION AND COVER COMPOSITIONS FOR V-BELTS
Sidney R. Fix, Stanley W. Olson, and John C. Wolfe, Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Original application Feb. 6, 1968, Ser. No. 703,248, now Patent No. 3,541,872, dated Nov. 24, 1970. Divided and this application Apr. 22, 1970, Ser. No. 38,643
Int. Cl. C08d *13/00*
U.S. Cl. 260—17.4 BB **5 Claims**

V-belts containing the cushion compositions and/or elastomeric impregnated fabric envelopes which contain

polyfluorohydrocarbon resins which increase the resistance to failure due to flexing of said V-belts.

3,661,824

ANTIBLOCKING AGENTS FOR ACRYLATE FILM

George P. Patitsas and Richard G. Bauer, Kent, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,232
Int. Cl. C08f *29/46*
U.S. Cl. 260—23 AR 4 Claims

Acrylate film such as the polymers of 2-ethylhexyl acrylate and acrylonitrile are compounded with a combination of ethylene N-bis oleamide and an animal fat glyceride to improve the antiblocking characteristics of the film.

3,661,825

STABILIZATION SYSTEMS FOR POLYMERS

James W. Horvath, Cuyahoga Falls, Ohio, and Charles A. Markley, West Chester, Pa., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 21, 1970, Ser. No. 30,399
Int. Cl. C08d *11/04*
U.S. Cl. 260—23.7 M 8 Claims

Stabilizer systems for polymers containing divinyl benzene (DVB) comprising certain phenolic stabilizers, epoxy polyvinyl chloride stabilizers and other polyvinyl-chloride stabilizers such as the organo-tin types.

3,661,826

WAX COMPOSITIONS COMPRISING PETROLEUM WAXES WITH CERTAIN HYDROGENATED TWO-BLOCK COPOLYMERS

Dale J. Meier, 6612 Lautrec Place, Palos Verdes Peninsula, Calif. 90274

No Drawing. Filed May 8, 1970, Ser. No. 35,942
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 B 1 Claim

Wax compositions comprising hydrocarbon waxes with certain hydrogenated two-block copolymers have viscosities, tensile strength, hardness and adhesion substantially greater than that of the unmodified petroleum wax.

3,661,827

METHOD FOR PREPARING A WATER-DISPERSIBLE ACRYLIC COPOLYMER

David D. Taft, Minneapolis, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.

No Drawing. Filed July 17, 1968, Ser. No. 745,363
Int. Cl. C08f *19/10, 19/00*
U.S. Cl. 260—29.6 MN 3 Claims

Water dispersible copolymers are prepared and dispersed or diluted in water without the use of emulsifiers. A water dispersible acrylic copolymer can be prepared in the absence of emulsifiers by the copolymerization of vinyl comonomers (e.g. methyl methacrylate, styrene, and acrylic acid) in a mixture of water miscible organic solvent, water and a neutralizing agent (e.g. a tertiary amine such as triethyl amine).

3,661,828

THERMOSET MOLDING POWDERS EMPLOYING GLYCIDYL METHACRYLATE AND DIPHENOLS

John F. Fellers, Livonia, Santokh S. Labana, Dearborn Heights, and Seymour X. Newman, Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 5, 1970, Ser. No. 43,896
Int. Cl. C08f *45/36*
U.S. Cl. 260—29.1 R 14 Claims

Novel thermosetting resin powders which can be molded to form products characterized, in tensile measurement, by high elongation-to-break, high tensile strength and modulus and a high glass transition temperature are prepared from a mixture of a prepolymer consisting essentially of glycidyl methacrylate, methyl methacrylate, and methacrylonitrile or acrylonitrile and a diphenol crosslinking agent.

3,661,829

AQUEOUS SULFO MODIFIED MELAMINE-FORMALDEHYDE RESIN COMPOSITION CONTAINING MULTIVALENT OXIDES

Alois Aignesberger and Horst Michaud, Trostberg, Germany, assignors to Suddentsche Kalkstickstoff-Werke AG, Trostberg, Germany

No Drawing. Filed May 6, 1970, Ser. No. 35,259
Int. Cl. C08g *9/30, 51/04*
U.S. Cl. 260—29.4 R 2 Claims

An aqueous solution of a melamine-formaldehyde resin containing enough sulfo groups to be water soluble combined with one or more basic or amphoteric oxides or hydroxides of trivalent or quadrivalent metals is a strong binder for sand, cement, and the like.

3,661,830

UNSATURATED ALKYL SULFAMATES, METHOD OF PREPARING SUCH SULFAMATES, AND THEIR USE AS SLIP AGENTS IN POLYETHYLENE

Robert W. Hill, Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Original application Aug. 28, 1967, Ser. No. 663,568, now Patent No. 3,580,944. Divided and this application Aug. 19, 1970, Ser. No. 65,276
Int. Cl. C08f *45/46, 45/60*
U.S. Cl. 260—30.8 R 8 Claims

Unsaturated alkyl sulfamates having 10 to 22 carbon atoms, such as erucyl sulfamate and oleyl sulfamate, are prepared by refluxing the corresponding monounsaturated alkenol with sulfamide in a suitable solvent, such as dioxane, until evolution of ammonia ceases. These monounsaturated alkyl sulfamates are useful as slip additives in mono-olefin polymers, such as polyethylene or polypropylene when added in amounts from 0.005 to 1 percent by weight.

3,661,831

TETRAFLUOROETHYLENE/HEXAFLUOROPROPYLENE COPOLYMER PARTICLES DISPERSED IN ORGANIC LIQUIDS

James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of applications Ser. No. 413,333, Nov. 23, 1964, Ser. No. 528,047, Feb. 17, 1966, Ser. No. 654,333, July 19, 1967, and Ser. Nos. 738,817 and 738,818, both June 21, 1968. This application July 1, 1970, Ser. No. 51,722
Int. Cl. C08f *45/28, 45/34, 47/20*
U.S. Cl. 260—32.8 A 32 Claims

Dispersions of tetrafluoroethylene/hexafluoropropylene copolymers in organic liquids, containing other film-forming materials, and articles coated with these dispersions.

3,661,832

POLYTRIMELLITAMIDE-IMIDES IN PHENOLIC SOLVENTS

James R. Stephens, Gary, Ind., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 252,557, Jan. 21, 1963, Ser. No. 336,857, Jan. 10, 1964, Ser. No. 535,367, Mar. 18, 1966, and Ser. No. 631,173, Apr. 17, 1967, which is a continuation-in-part of application Ser. No. 535,367. This application May 20, 1970, Ser. No. 39,177
Int. Cl. C08g *20/32, 51/34*
U.S. Cl. 260—33.4 P 6 Claims

An aromatic polytrimellitamide-imide solution suitable for producing smooth continuous coatings and wire

enamels at baking temperatures of about 400° F. said solution comprising said polytrimellitamide-imide and phenols or substituted phenols. A process for producing wire enamels wherein said aromatic polytrimellitamides are dissolved in phenol or alkyl substituted phenols and a process for preparing polytrimellitamide-imide polymers in alkyl substituted phenol solutions.

3,661,833

FAST CURING ORGANOSILOXANE RESINS

Willard D. Larson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 9, 1970, Ser. No. 53,628

Int. Cl. C08f *45/30*

U.S. Cl. 260—33.8 SB 8 Claims

Curable fluorosilicone resins are disclosed. Such resins consist of a random organosiloxane resin base having a degree of substitution from 0.95 to 1.7 inclusive, the organic substituents being monovalent hydrocarbon or monovalent halohydrocarbon radicals, at least 70 mol percent of these substituents being 3,3,3-trifluoropropyl radicals, curability resulting from termination of the resin base with monoorganodihydroxylsiloxy units, monomethyldihydroxylsiloxy units being present in amounts in the range of from 0.05 to 0.5 moles per 100 grams of the random organosiloxane resin base. The curable fluorosilicone resins can be used as molding compositions, laminating resins, coatings and varnishes.

3,661,834

RESILIENT PLASTIC ARTICLE AND PROCESS FOR FORMING THE SAME

Robert H. Pasley, Coral Gables, Fla., assignor to Royalty Designs of Florida, Inc., Hialeah, Fla.

No Drawing. Filed Feb. 4, 1970, Ser. No. 8,688

Int. Cl. C08f *45/38, 45/26, 47/20;* C08g *53/18*

U.S. Cl. 260—34.2 5 Claims

This disclosure deals with a novel quivery resilient plastic article and process for forming the same useful for cushioning purposes and for application as protective coatings, involving a very highly plasticized, preferably polyvinyl chloride plastic, having ratios of plasticizer-to-resin of the order of substantially 12-to-1 ± about 35%.

3,661,835

PROCESS FOR PREPARING A DISPERSION OF SPHERICAL AGGREGATES OF AMPHIPATHIC POLYMER

Alan Stuart Baker, George Green, and Julian Alfred Waters, Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,127

Claims priority, application Great Britain, Aug. 14, 1969, 40,644/69

Int. Cl. C08j *1/46*

U.S. Cl. 260—34.2 6 Claims

Process of preparing dispersions containing spherical aggregates of amphipathic copolymer in which the copolymer is dissolved in a common solvent for two different polymeric components of the copolymer and constituents of this solvent are removed by distillation to leave a solvent for only one of the components. The dispersions are useful in coatings.

3,661,836

METAL-CONTAINING POLYACYLOXALAMIDRAZONES

Albert Schopf, Hering, Michael Wallrabenstein, Hans-Dieter Rupp, and Helmut Magerlein, Erlenbach, Heinz Grotjahn, Rollfeld, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed Apr. 27, 1970, Ser. No. 32,393

Claims priority, application Germany, May 2, 1969, P 19 22 334.8

Int. Cl. C08g *33/04, 51/04;* C08k *1/06*

U.S. Cl. 260—37 N 10 Claims

A metal-containing polyacyloxalamidrazone in which the metal is chemically bound to the polymer to provide a heat-resistant colored composition useful as a pigment or a supported metal catalyst.

3,661,837

CONTINUOUS INCORPORATION OF GLASS FIBERS INTO POLYAMIDES

Anton Cadus, Ludwigshafen, Hermann Uhr, Frankenthal, and Reinhold Weber, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed May 27, 1970, Ser. No. 41,080

Claims priority, application Germany, May 29, 1969, P 19 27 271.0

Int. Cl. C08g *51/10*

U.S. Cl. 260—37 N 6 Claims

Continuous incorporation of glass fibers into synthetic linear polyamides having periodically recurring amide groups in the main chain in a screw extruder, glass fibers and unmelted plastics granules being supplied simultaneously or successively to the polyamide melt and the unmelted granules serving as comminuting aids.

3,661,838

SCENTED PLASTIC COMPOSITION

Fumio Enomoto, 4–5 Bunkyo-machi, Hatano, Kanagawa, Japan

No Drawing. Continuation-in-part of application Ser. No. 686,791, Nov. 30, 1967. This application Mar. 9, 1970, Ser. No. 17,871

Int. Cl. C08k *1/08, 1/20;* A61k *1/02*

U.S. Cl. 260—41 A 12 Claims

A scented plastic composition capable of emitting a scent is obtained by dispersing in a gas-permeable plastic material a porous finely divided silica powder having adsorbed thereon a liquid scent-emitting substance, such as a floral perfume or an essential oil. Processes of preparation are described.

3,661,839

HEAT CURABLE GLASS FIBER FILLED POLYVINYL CHLORIDE COMPOSITIONS

Oskar E. H. Klopfer, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,874

Int. Cl. C08f *45/72, 47/12*

U.S. Cl. 260—41 AG 4 Claims

A cross-linked, heat stable, glass filled polyvinyl halide composition and a process for the preparation thereof. The composition is prepared by mixing together polyvinyl halide resin, a stabilizer, a lubricant, a cross-linkable monomer, an inhibitor, and glass fibers to form a dry

blend which is milled on a hot, two-roll mill to form a rigid sheet. The sheet is heat treated to increase deflection temperature.

3,661,840

PEELABLE METAL PROTECTANTS

Henry M. Deutsch, Fullerton, Calif., assignor to Organocerams, Inc., Placentia, Calif.

No Drawing. Continuation-in-part of application Ser. No. 642,198, May 29, 1967. This application Apr. 18, 1968, Ser. No. 722,156

Int. Cl. C23b *3/04*

U.S. Cl. 260—41.5 R 10 Claims

A low solvent, high solids containing maskant or metal protectant film forming liquid composition including a low molecular weight liquid diene prepolymer having end and side chain functionality such as a 1000–2000 equivalent weight hydroxyl, thiol, epoxy, amine, carboxyl, chloro or isocyanate terminated and side chain modified diene polymer having a functionality of at least 2 and a cross-inking and curing agent such as an aliphatic, cycloaliphatic or aromatic polyisocyanate, polyamine, polyol, or polybasic acid, acid chloride or anhydride. Said composition being curable to form a peelable polymeric film having a molecular weight greater than 20,000. The maskant film may contain aluminum, magnesium or calcium carbonate, oxide or silicate fillers such that the film is translucent as applied, but becomes visible in regions that are mechanically stressed.

3,661,841

FLAME RETARDANT POLYMERS

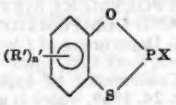
James L. Dever, Lewiston, and James J. Hodan, Williamsville, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application June 14, 1967, Ser. No. 645,873, now Patent No. 3,522,331. Divided and this application Apr. 20, 1970, Ser. No. 38,615

Int. Cl. C09k *3/28*

U.S. Cl. 260—45.8 R 10 Claims

Compounds are described of the structure



wherein R′ is selected from the group consisting of alkyl of 1 to 18 carbon atoms, aryl of 6 to 12 carbon atoms and cyclohexyl; X is a halogen selected from the group consisting of chlorine, bromine and iodine; and *n′* ranges from 0 to 4. The compounds are prepared by reacting an orthomercaptophenol compound with phosphorus trihalide. The resulting compounds can be used to impart fire retardancy to plastic compositions, in particular polystyrene.

3,661,842

POLYESTERS STABILIZED WITH AMMONIUM HEXAFLUOROPHOSPHATE FLUORIDE, TRIPROPYLAMMONIUM DIHYDROGEN PHOSPHATE, AND TETRAMETHYLAMMONIUM HEXAFLUOROPHOSPHATE

John A. Price, Swarthmore, and Mary J. Stewart, Media, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,600

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.9 5 Claims

A stabilized polyester resin composition comprising the product formed by incorporating a minor amount of a compound selected from the group consisting of tetramethylammonium hexafluorophosphate, tripropylammonium dihydrogen phosphate, and ammonium hexafluorophosphate fluoride into a melted saturated polyester resin.

3,661,843

TRANSITION METAL COMPLEXES WITH TRIVALENT PHOSPHORUS COMPOUNDS USEFUL AS STABILIZERS FOR POLYMERS

Ingenuin Hechenbleikner, Park Ridge, N.J., and Thomas G. Kugele, Cincinnati, and John F. Hussar, Loveland, Ohio, assignors to Cincinnati-Milacron Chemicals, Inc., Reading, Ohio

No Drawing. Filed Oct. 27, 1970, Ser. No. 84,494

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 N 7 Claims

Ultraviolet light absorbers and stabilizers, particularly for monoolefin polymers, are provided from metal complexes of trivalent phosphorus compounds of the formulae

$$Me(L)_n(A)_m(L')_o$$

where Me is preferably nickel but can be manganese, iron, copper, molybdenum or tungsten, L is (P(X)(Y)(Z) where any one or all of X, Y and Z can be O hydrocarbyl,

where R_{31} and R_{32} are hydrocarbyl or hydrogen, S hydrocarbyl, hydrocarbyl, 2 or 3 of X, Y and Z can form one or more heterocyclic rings with P, A is an anion such as halogen, e.g. Cl, Br, I or F, NO_3, ClO_4, $R_{33}COO^-$ where R_{33} is hydrocarbyl, any hydrocarbyl group can have 1 or 2 halogen substituents, *m* is 0 or a small whole number, e.g. 1, 2, 3, 4, L′ is CO, NO, CN, halogen, *o* is zero or a small whole number, e.g. 1, 2, 3, 4, *n* is 1 or another small whole number, e.g. 2, 3, 4, $o+m+n$ is not greater than the highest coordination number of the metal.

3,661,844

ORGANIC ACYL THIOACETAL AND THIOKETAL STABILIZERS FOR HALOGENATED RESINS

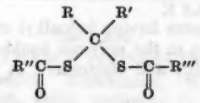
Christian H. Stapfer, Newtown, Pa., assignor to Cincinnati-Milacron Chemicals, Inc., Reading, Ohio

No Drawing. Filed Dec. 11, 1970, Ser. No. 97,310

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.95 10 Claims

Polyvinyl chloride formulations containing organic acyl thioacetals or thioketals of the formula



wherein R and R′ may be hydrogen or may be joined in such a way to make a cyclo aliphatic group, R″ and/or R‴ are alkyl, aryl, aralkyl, alkaryl are stabilized against thermal degradation. Furthermore, R or R′ can be a repetition of the thioacetal group, or be difunctional.

3,661,845

FAST CURE ORGANOSILOXANE RESINS AND METHOD FOR PREPARING SAME

Robert C. Antonen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 9, 1970, Ser. No. 53,632

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 R 9 Claims

Mixing a random organosiloxane resin and an organoacetoxysilane, such as methyltriacetoxysilane, in an organic solvent, allowing the mixture to react, adding the reaction product to water thus hydrolyzing the acetoxy groups, allowing an aqueous phase and an organic solvent product to form, separating same and thereafter azeotroping any residual water and by-products is a useful method

for obtaining a fast cure organosiloxane resin which has a random organosiloxane resin base terminated by hydroxyl bearing organosiloxane units, such as monomethylsiloxane units. The fast cure organosiloxane resin is useful to provide faster curing resins for laminates, molding compounds and paints than conventional random organosiloxane resins.

3,661,846

ORGANO-INORGANO POLYMERS AND THEIR PREPARATION

Malcolm E. Kenney, 1203 Hereford Road, Cleveland Heights, Ohio 44118

No Drawing. Continuation-in-part of application Ser. No. 831,745, June 9, 1969, which is a continuation-in-part of abandoned application Ser. No. 662,239, July 31, 1967. This application Sept. 4, 1970, Ser. No. 69,883
Int. Cl. C08 *11/04*
U.S. Cl. 260—46.5 R 12 Claims

Organo-inorgano polymers, useful as thermal insulators and as reinforcing agents for resins, through a method including: contacting the ordered sheet silicate minerals chrysotile and apophyllite with an organosilicon compound and strong acid in an organic liquid between 20° C. and up to and including reflux temperature for at least one hour; and subsequently contacting under more nearly neutral conditions the resulting product thereof with an organosilicon compound neat or in an organic solvent between 20° C. and up to and including reflux temperature for at least one hour. Hydrophobic, ordered, organo-inorgano polymers of a molecular weight of more than ten thousand and consisting essentially of carbon, hydrogen, silicon, and oxygen with at least 65 percent by weight thereof being silicon and oxygen, possessing a sheet silicate framework consisting essentially of silicon and oxygen and alike the sheet silicate framework of its mineral source while substantially free from metal atoms found in its mineral source, and having organosiloxy groups appended in substantial amount to silicon atoms of its sheet silicate framework.

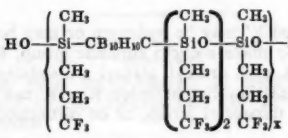
3,661,847

CARBORANE-SILOXANE POLYMERS

Dwain R. Chapman, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed May 1, 1969, Ser. No. 821,105
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 E 16 Claims

Siloxane polymers having haloalkyl substituents and a carborane linkage in the polymer backbone provide heat stable fluids, resins and elastomers. A specific polymer



can be compounded with silica to form an elastomer which is stable at temperatures of 600° F. and greater.

3,661,848

FORMATION OF POLYPHENYLENE ETHERS

Glenn D. Cooper, Delmar, and James G. Bennett, Menands, N.Y., assignors to General Electric Company

No Drawing. Continuation of abandoned application Ser. No. 807,076, Mar. 13, 1969. This application Nov. 6, 1970, Ser. No. 87,645
Int. Cl. C08g *23/18*
U.S. Cl. 260—47 ET 15 Claims

A process for the formation of high molecular weight polyphenylene ethers by the oxidative coupling of a phenolic percursor in a reaction system containing a low molecular weight alcohol and a complex catalyst formed from a non-basic cupric salt and a primary or secondary amine. The process is characterized by the addition of the alcohol to the reaction system which (1) results in the formation of higher molecular weight polymer in a given reaction time or polymer of comparable molecular weight in substantially decreased reaction time and (2) permits the use of aqueous solutions of cupric salts and cupric salts in hydrated form.

3,661,849

HETEROCYCLIC POLYIMIDES PREPARED FROM HETEROCYCLIC DIAMINES

Billy M. Culbertson, Burnsville, Minn., assignor to Ashland Oil & Refining Company, Ashland, Ky.

No Drawing. Filed Oct. 6, 1965, Ser. No. 493,564
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP 13 Claims

Novel, heterocyclic ring-containing polyimides, useful in the formation of films and fibers are formed by reacting aromatic tetracarboxylic acid anhydrides with diamines having the following formula

$$H_2N—R—NH_2$$

wherein R is a divalent radical containing from one to two benzoxazole, benzimidazole, or benzothiazole moieties, said divalent radical containing at least two aromatic ring structures, the amine groups of said diamine being attached to aromatic carbon atoms located in different ring structures, in an organic solvent for at least one reactant at a temperature below 150° C. to form a polyamide-acid intermediate and then converting said polyamide-acid intermediate to the polyimide.

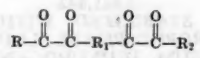
3,661,850

QUINOXALINE POLYMERS, METHODS OF MAKING SAME AND COMPOSITIONS THEREOF

John K. Stille, % Department of Chemistry, University of Iowa, Iowa City, Iowa 52240

No Drawing. Continuation of application Ser. No. 819,532, Apr. 24, 1969, which is a continuation-in-part of abandoned application Ser. No. 344,232, Feb. 12, 1964. This application July 16, 1970, Ser. No. 55,588
Int. Cl. C08g *9/06*
U.S. Cl. 260—50 39 Claims

Polymers containing recurring quinoxaline groups which are the reaction products of aromatic tetramines containing two sets of ortho-amine functions attached to the aromatic nucleus and tetracarbonyl compounds having the formula:



wherein R and R_2 represent a member selected from the group consisting of hydrogen and monovalent hydrocarbon groups, and R_1 represents a divalent hydrocarbon group. The salts of the aromatic tetramines and the hydrates of the tetracarbonyl compounds may also be used to prepare the polymers. Quinoxaline polymers can be used for making films, fibers and ahhesives as well as for other purposes. Laminated articles bonded together with these adhesive compositions, such as high temperature metal laminates are also disclosed.

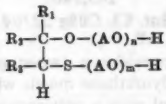
3,661,851

POLYALKYLENEGLYCOL ETHERS OF HYDROXYALKYLMERCAPTANS AND PROCESS

Wilfried Umbach, Langenfeld, Rhineland, Rainer Mehren, Neuss, Rhineland, and Werner Stein, Erkrath-Unterbach, Rhineland, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,350
Claims priority, application Germany, Oct. 8, 1968, P 18 01 712.4
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 R 3 Claims

Polyalkylene glycol ethers of β-hydroxymercaptans of the formula



wherein R_1 is a member selected from the group consisting of alkyl having from 1 to 22 carbon atoms, alkoxyalkyl having from 2 to 22 carbon atoms, haloalkyl having from 1 to 22 carbon atoms, cycloalkylalkyl having from 6 to 22 carbon atoms and alkenyl having from 3 to 22 carbon atoms, R_2 and R_3 are members selected from the group consisting of hydrogen, and R_1 and when taken together alkylene having from 3 to 4 carbon atoms, with the proviso that the sum of the carbon atoms in R_1, R_2 and R_3 is from 4 to 22; A is a bivalent member having from 2 to 4 carbon atoms selected from the group consisting of alkylene, haloalkylene and hydroxyalkylene; n is an integer from 0 to 50; m is an integer from 1 to 50; and the sum of n and m is an integer from 1 to 50. The compounds have surface-active properties and are useful per se or as intermediates.

3,661,852

POLYAMIDE-IMIDE COMPOSITIONS WITH IMPROVED HYDROLYTIC STABILITY

Ralph G. Flowers, Pittsfield, and Thomas L. Sherer, Richmond, Mass., assignors to General Electric Company

Filed May 11, 1970, Ser. No. 36,309
Int. Cl. C08g *20/32*
U.S. Cl. 260—65 5 Claims

This invention relates to new polyamide-imide compositions having improved hydrolytic stability and formed by reacting maleic anhydride with the product obtained by reacting a dianhydride with an intermediate diamine formed by reaction of trimellitic anhydride, hexamethylene diamine and an aromatic diamine. The resulting composition is useful for electrical insulating purposes in the form of films or coatings.

3,661,853

FILAMENTARY MATERIAL

Myron J. Coplan, 47 Speen St., Natick, Mass. 01760; Howard I. Freeman, 34 Livingston Road, Sharon, Mass. 02067; and Joseph S. Panto, P.O. Box 223, Dover, Mass. 02030

Continuation of application Ser. No. 859,597, Jan. 2, 1969, which is a division of application Ser. No. 341,725, Jan. 31, 1964. This application July 10, 1970, Ser. No. 56,187
Int. Cl. D01d *5/12*
U.S. Cl. 260—67 FP 6 Claims

A melt spun random oxymethylene polymer filamentary material having at 70 degrees Fahrenheit an elastic recovery of at least about 70 percent from an extension up to about 50 percent.

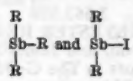
3,661,854

METHOD FOR PREPARING RANDOM COPOLYMERS OF FORMALDEHYDE AND OLEFIN OXIDES AND/OR VINYL ETHERS

Robert Alton Setterquist, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 9, 1970, Ser. No. 9,983
Int. Cl. C08g *1/18*
U.S. Cl. 260—67 FP 17 Claims

Random copolymers of formaldehyde monomer and olefin oxides and/or vinyl ether monomers can be prepared by reacting said monomers at a temperature of from about −20° to about 100° C. in the presence of a perfluoroalkylstibine catalyst having the formula



in which R is perfluoroalkyl of from 1–8 carbon atoms.

3,661,855

CROSS-LINKABLE ACETALDEHYDE CO-POLYMERS

Georges Ivanovsky, Verneuil-en-Halatte, France, assignor to Societe Chimiques des Charbonnages, Paris, France

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,739
Claims priority, application France, Sept. 3, 1968, 164,969
Int. Cl. C08g *1/14*
U.S. Cl. 260—67 R 2 Claims

Cross-linkable elastomer co-polymers of acetaldehyde with a monomer compound possessing at the same time an epoxy function fixed on two vicinal carbon atoms of a saturated hydrocarbon cycle and an epoxy function fixed on two vicinal aliphatic carbon atoms, the said co-polymers having an absorption band for infra-red at 4520 $cm.^{-1}$ which is characteristic of a free epoxy function. The method of manufacture of said elastomer co-polymers comprises the polymerization of acetaldehyde with said monomer compound by means of Lewis acid catalyst at a temperature lower than −40° C.

3,661,856

DYEABLE POLYESTER

Anthony L. Lemper, Tonawanda, N.Y., and Yuzi Okuzumi, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 873,694, Nov. 3, 1969. This application June 29, 1971, Ser. No. 158,125
Int. Cl. C08g *17/14*
U.S. Cl. 260—75 S 16 Claims

Polyethylene terephthalate and terephthalate copolyesters in fibers and fabrics are treated with an alkali metal salt of 2-bromoethane sulfonic acid to render the fibers and fabrics more dyeable with cationic dyestuffs.

3,661,857

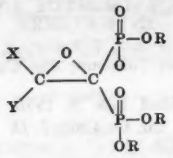
POLYMERIC COMPOSITIONS

Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,032
Int. Cl. C08g *22/16, 51/54;* C08f *45/54*
U.S. Cl. 260—75 NR 6 Claims

A polymer comprising a reactive hydrogen containing material such as polyurethane, copolymerized with sub-

stituted epoxy ethane polyphosphonate having the formula



wherein R is hydrogen or an organic radical and X and Y are hereinafter defined.

3,661,858

REDUCING POLYESTER REACTOR SCALE

Clyde E. Gleim, Akron, and James A. Mally, Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,341
Int. Cl. C08g *17/013*
U.S. Cl. 260—75 R 12 Claims

During the alcoholysis step in producing polyesters reactor scale and catalyst precipitation are reduced by using a phosphorous-free manganese octoate or phosphorous-free manganese 2-ethyl hexoate catalyst, or by the addition of free octonoic acid and/or 2-ethyl hexanoic acid to the reactor.

3,661,859

POLY(1,3-IMIDAZOLIDINE-2,4,5-TRIONES)

Tad L. Patton, Baytown, Tex., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 808,004, Mar. 17, 1969. This application Apr. 17, 1970, Ser. No. 29,657
Int. Cl. C08g *22/00, 22/08*
U.S. Cl. 260—77.5 CH 39 Claims

New heterocyclic polymers containing the 1,3-imidazolidine-2,4,5-trione-1,3-diyl structure are produced by hydrolyzing the polymers formed by the reaction of diisocyanates with hydrogen cyanide, by the reaction of dicyanoformamides with diisocyanates and by the polymerization of cyanoformamidyl isocyanates. The new heterocyclic polymers are stable and are useful in the formation of films, fibers, foams, and molded objects.

3,661,860

HYDROPHILIC POLYURETHANE

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

No Drawing. Filed May 11, 1970, Ser. No. 36,465
Int. Cl. C08g *22/14*
U.S. Cl. 260—77.5 AQ 2 Claims

Hydrophilic polyurethane suitable as elastic film or foam of high tensile strength is prepared by introducing a tertiary amine copolymer segment which imparts hydrophilic properties without reducing the tensile strength of the resulting product.

3,661,861

PROTECTIVE COATING WHICH IS PRODUCED BY REACTING MOISTURE WITH A PREPOLYMER MADE BY REACTING AN OXAZOLINE WITH A DIISOCYANATE

Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed May 12, 1970, Ser. No. 36,681
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 R 9 Claims

A prepolymer compound consisting of the reaction product of a mono-, bis- or tris-oxazoline with toluene diisocyanate dissolved in a solvent thereby providing an air-drying coating material which forms a smooth, continuous film by reaction with atmospheric moisture.

3,661,862

PROCESS FOR THE PREPARATION OF POLYURETHANE MASTICS

Yves Bonin and Jean Robin, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Mar. 11, 1969, Ser. No. 806,310
Claims priority, application France, Mar. 12, 1968, 143,386
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 AP 11 Claims

The invention provides a two-stage process for the preparation of a polyurethane mastic which comprises first reacting a macrodiol with a polyisocyanate in an amount such that there are 1 to 2 isocyanate groups per hydroxyl group to produce an isocyanate terminated prepolymer and then adding more polyisocyanate.

3,661,863

COPOLY(AMIDE-IMIDE)S COMPRISING THE REACTION PRODUCT OF A DIACID, A TRIACID AND BIS(4-AMINOCYCLOHEXYL)METHANE

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 11, 1970, Ser. No. 45,586
Int. Cl. C08g *20/32*
U.S. Cl. 260—78 TF 9 Claims

Copoly(amide-imide)s are obtained by using a combination of both a dicarboxylic acid and tricarboxylic acid in polymerization with PACM.

3,661,864

METHOD OF PRODUCING CONTROLLED-FORM PRECIPITATES

James S. Tapp, Kettering, Ohio, Robert E. Colwell, Simsbury, Conn., and Myron K. Toney, Greenwood, S.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1969, Ser. No. 808,605
Int. Cl. C08f *3/74*; C08g *20/38*
U.S. Cl. 260—78 S 3 Claims

Precipitates of controlled morphology are produced by subjecting a pregnant solution and a precipitant to centrifugal action whereby controlled amounts of the solution and precipitant are thrown into random contact causing a precipitate to form; then by collecting and separating the precipitate from the excess of the solution and precipitant.

3,661,865

PRODUCTION OF ABC TERPOLYMERS

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company

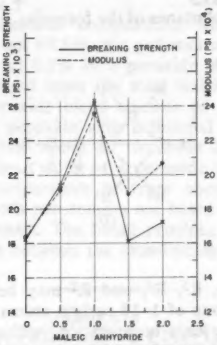
No Drawing. Filed May 1, 1969, Ser. No. 821,069
Int. Cl. C08g *17/003*
U.S. Cl. 260—78.4 16 Claims

ABC terpolymers, which can be used as adhesives and as terminating agents for lithium initiated polymerizations, are prepared by polymerizing a mixture of an alkene oxide, a cyclic acid anhydride and a cyclic ether in the presence of an organometallic compound.

3,661,866
HIGH STRENGTH POLYSTYRENE

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 11, 1970, Ser. No. 36,271
Int. Cl. C08f *27/00*
U.S. Cl. 260—78.4 D 10 Claims



Polystyrene of increased strength and resistance to thermal degradation is produced by reaction with maleic anhydride and a free radical former at elevated temperatures.

3,661,867
METHOD FOR PRODUCING CHLORIDE BY SUSPENSION POLYMERIZATION

Shunichi Koyanagi, Hajime Kitamura, Kinya Ogawa, and Shigenobu Tajima, Naoetsu-shi, Japan, assignors to Shinetsu Chemical Company

No Drawing. Filed Dec. 10, 1970, Ser. No. 96,977
Claims priority, application Japan, Dec. 15, 1969, 44/100,787
Int. Cl. C08f *1/11, 3/30*
U.S. Cl. 260—78.5 CL *7* Claims

A dialkyl peroxydicarbonate whose alkyl radical has 1–8 carbon atoms, an acetyl cyclohexyl sulfonyl peroxide or a mixture thereof is added to vinyl chloride or a mixture of vinyl monomers having vinyl chloride as its main component. 0.001–0.5% by weight, based on the weight of the monomer(s), of the dialkyl peroxydicarbonate, acetylcyclohexyl sulfonyl peroxide or mixture thereof is added. The resultant mixture is maintained at a temperature not exceeding 35° C. for 0.5 to 2 hours. The pH is adjusted to 8–11. The resultant mixture is heated at 40–70° C. in the presence of a polymerization initiator to substantially complete the polymerization. The initiator is selected from the group consisting of azobis-2,4-dimethylvaleronitrile, azobismethoxyvaleronitrile, azobistrimethylvaleronitrile, ter-butylperoxypivalate and mixtures thereof. The method substantially prevents polymer scale deposition on the interior walls of the polymerization vessel. The polymerization induction period is eliminated. The polyvinyl chloride produced has little color and has superior thermal stability.

3,661,868
FLOCCULANT

Benny G. Barron, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 1, 1970, Ser. No. 33,925
Int. Cl. C08f *15/02*
U.S. Cl. 260—80.3 N 6 Claims

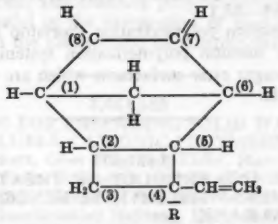
In the inverse suspension polymerization of a mixture of acrylamide and an N-(dialkylaminoalkyl)acrylamide or methacrylamide, the resulting cationic copolymer has superior flocculating capacity when there is present in the mixed monomers a small amount of an N-(dialkylaminoalkyl) - 3 - (dialkylaminoalkylamino)propionamide. This additive preferably corresponds in its carbon skeleton and nitrogen atom substituents to the cationic monomer.

3,661,869
POLYCYCLIC UNSATURATED HYDROCARBONS AND PROCESS FOR THEIR PREPARATION

Alberto Greco, Antonio Carbonaro, and Gino Dall'Asta, Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

No Drawing. Filed May 11, 1970, Ser. No. 36,444
Claims priority, application Italy, May 12, 1969, 16,717/69
Int. Cl. C07c *13/00;* C08f *19/00*
U.S. Cl. 260—80.78 9 Claims

New doubly unsaturated polycyclic hydrocarbons having the general Formula I:



(I)

in which R is H or CH_3, are disclosed. Polycyclic unsaturated hydrocarbons included in Formula I are 4-vinyl-tricyclo[4,2,1,$0^{2,5}$]nona-7-ene and 4-methyl-4-vinyl tricyclo-[4,2,1,$0^{2,5}$]nona-7-ene. The new polycyclic hydrocarbons having two types of unsaturation are addition products, or hetero-dimers, of bicyclo[2,2,1]hepta-2,5-diene(2,5-norbornadinene) and a conjugated aliphatic diene, such as butadiene-1,3 or isoprene, and are obtained by reacting the monomers in the presence of particular catalysts.

3,661,870
ISOBUTYLENE, 1,3-BUTADIENE, METHYL BUTENE COPOLYMERS

Herbert L. Bullard, Norton Village, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,523
Int. Cl. C08f *17/00*
U.S. Cl. 260—80.7 4 Claims

A resinous material, typically essentially noncyclic, useful as a tackifier, and having a softening point in the range of from about 20° C. to about 40° C., which comprises from about 25 to 75 weight percent units derived from isobutylene, from about 5 to about 50 weight percent units derived from 1,3-butadiene, from about 5 to about 50 weight percent units derived from 2-methyl-1-butene, and up to about 10 weight percent units derived from 3-methyl-1-butene, wherein the ratio of the units derived from isobutylene to units derived from 1,3-butadiene is from about 1:1 to about 5:1.

3,661,871
PRODUCTION OF NON-CONJUGATED DIENES HAVING 4,7,8,9-TETRAHYDROINDENE STRUCTURES FROM A HYDROCARBON MIXTURE CONTAINING CYCLOPENTADIENE AND ANOTHER C_5 CONJUGATED DIENE AND PRODUCTION OF VULCANIZABLE COPOLYMERS THEREFROM BY POLYMERIZATION WITH α-OLEFINS

David Arthur Gregson Walmsley, Runcorn, and Roy John Sampson, Billingham, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 3, 1967, Ser. No. 635,673
Claims priority, application Great Britain, May 24, 1966, 23,152/66
Int. Cl. C08f *17/00*
U.S. Cl. 260—80.78 15 Claims

Amorphous vulcanisable high molecular weight polymers obtained by the copolymerisation of at least one

α-olefin with a hydrocarbon fraction containing non-conjugated dienes selected from 4,7,8,9-tetrahydroindene and methyl derivatives thereof, said fraction having been obtained by heating a multi-component hydrocarbon stream containing cyclopentadiene and at least one other C_5 conjugated diene to cause Diels-Alder reaction between the said dienes.

3,661,872
SHORTSTOP AND STRIPPING AIDS

James N. Short, Bartlesville, Okla., and Antonio A. Geraldo, Borger, Tex., assignors to Phillips Petroleum Company

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,073
Int. Cl. C08d *5/02, 3/04, 3/08*
U.S. Cl. 260—85.1 **8 Claims**

A combination polymerization shortstop and stripping process for solution polymerization systems comprising the use of sugar ester surfactants which are either oil- or water-soluble.

3,661,873
PROCESS AND PRODUCT OF TREATING LIVE POLYMERS WITH DIVINYL BENZENE AND A HALOALKANE

Adel F. Halasa, Bath, and Ervin E. Schroeder, North Canton, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 716,345, Mar. 27, 1968. This application Jan. 6, 1971, Ser. No. 104,469
Int. Cl. C08d *5/04;* **C08f** *27/02, 19/08*
U.S. Cl. 260—85.1 **18 Claims**

The process described herein involves a method of converting relatively low molecular weight polymers of conjugated dienes prepared by alkali metal-catalyzed polymerizations, such as alkyllithium catalyzed polymerizations, and still containing active lithium or other alkali metal therein, by postreaction with a mixture of divinyl benzene and a haloalkane, such as carbon tetrachloride, to give higher molecular weight polymers having improved cold flow resistance, improved processability and green strength, etc. The improvements are much greater than can be effected by postreaction with either divinyl benzene or CCl_4 individually, or by having divinyl benzene present during the polymerization. The haloalkanes include chloro, bromo and iodo compounds and can have 1–4 or even more halogen atoms per molecule. The postreacted products are highly branched elastomers having a broad molecular weight distribution and possessing less cold flow than the polymers from which they are produced. Surprisingly, even though the molecular weight of the polymer is increased many times, the reaction product displays little or no tendency for cold flow even after extension with oil.

3,661,874
COMPOSITION OF MATTER

Melvin M. Olson, Richfield, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 871,529, Nov. 6, 1969, which is a continuation of abandoned application Ser. No. 469,902, July 6, 1965. This application June 5, 1970, Ser. No. 43,970
Int. Cl. C08d *5/02, 3/08, 3/12*
U.S. Cl. 260—83.3 **7 Claims**

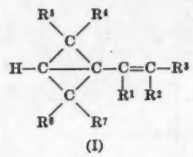
A water-soluble rubbery polymer formed by the reaction of an epoxidized water-insoluble neutral rubbery polymer and a water-soluble secondary mono amine.

3,661,875
1-(1-ALKENYL)BICYCLO[1.1.0]BUTANES AND THEIR POLYMERS

James B. Sieja, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,284
Int. Cl. C08f *15/02*
U.S. Cl. 260—85.5 **2 Claims**

Novel bicyclobutanes of the formula



(I)

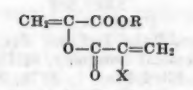
R^1, R^2, R^3, R^4, R^5, R^6, and R^7 may be hydrogen or a hydrocarbyl group of 1–18 carbon atoms which is free of olefinic or acetylenic unsaturation, with the proviso that the pairs R^1 and R^2, R^2 and R^3, R^4 and R^5, and R^6 and R^7 taken together may, respectively, be tetramethylene or pentamethylene diradicals. The above compounds are prepared by treating 3-alkoxycyclobutanone with a 1-alkenyl Grignard reagent to obtain the corresponding 1-alkenyl-3-alkoxy-1-hydroxycyclobutane which is treated with a hydrogen halide to form a mixture of 1-alkenyl-3-alkoxy-1-halocyclobutane and 3-alkoxy-1-(2-haloalkenylidene)cyclobutane. Those compounds are then treated with a metal capable of removing halogen (such as sodium, magnesium, zinc, etc.) to obtain the corresponding 1-(1-alkenyl)bicyclo [1.1.0]butane. These bicyclobutanes can be converted to homo- and copolymers, which are useful as self-supporting films, fibers and molding powder.

3,661,876
ADHESIVES OR SEALING AGENTS WHICH HARDEN ON EXCLUSION OF OXYGEN

Bernd Wegemund, Hilden, Rhineland, and Joachim Galinke, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Mar. 30, 1970, Ser. No. 23,958
Claims priority, application Germany, Apr. 1, 1969, P 19 16 648.4
Int. Cl. C08f *3/64, 15/26*
U.S. Cl. 260—86.1 **8 Claims**

Adhesive compositions hardenable under exclusion of oxygen comprising liquid esters of methacrylic and acrylic acids which harden under exclusion of oxygen, an organic percompound selected from the group consisting of organic hydroperoxides having from 3 to 18 carbon atoms and organic peroxides whose half life decomposition temperature after 10 hours is greater than 85° C., and at least 10% by weight of a compound of the formula



wherein X represents a member selected from the group consisting of hydrogen, halogen and lower alkyl and R represents a hydrocarbon having from 1 to 12 carbon atoms. Said compositions form a heat-stable adhesive bond.

3,661,877
POLYMERIC COMPOSITIONS AND METHOD OF PREPARATION
Allen C. Bluestein, Succasunna, and Richard F. Grossman, Andover, N.J., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.
No Drawing. Filed May 21, 1970, Ser. No. 39,563
Int. Cl. C08f *15/04, 27/00, 45/02*
U.S. Cl. 260—86.7 15 Claims

A heat crosslinkable composition, which comprises about 94% to about 99.5% of a polymer of ethylene and about 6% to about 0.5% of a peroxide blend, both percentages being based upon the total weight of the composition. The peroxide blend consists of about 10% to about 90% of a peroxide with a thermal decomposition temperature of from about 80° to about 148° C. and of about 90% to about 10% of a peroxide with a thermal decomposition temperature of from about 105° C. to about 210° C. Both percentages are based upon the total weight of said blend. The blend provides a crosslinking action which lies between the crosslinking rate of either peroxide alone.

3,661,878
PROCESS FOR PRODUCING ETHYLENE POLYMERS AND ETHYLENE COPOLYMERS
Itsuho Aishima, Tokyo, Hisaya Sakurai, and Yukichi Takashi, Kawasaki-shi, Hideo Morita and Yoshiyuki Hirotsu, Yokohama-shi, and Tetsuo Hamada, Kawasaki-shi, Japan, assignors to Asahi Chemical Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed July 9, 1969, Ser. No. 840,475
Int. Cl. C08f *1/44, 3/06, 15/04*
U.S. Cl. 260—88.2 F 7 Claims

The polymerization of ethylene and the copolymerization of ethylene with one alpha-olefin having 3 to 10 carbon atoms in the presence of a catalyst prepared by the reaction between (A) at least one compound of the general formula:

$$R^1R^2HSiOAlR^3R^4$$

wherein R^1 and R^2 represent independently members selected from the group consisting of alkyl groups having 1 to 5 carbon atoms, cyclohexyl, phenyl and 1-naphthyl; R^3 and R^4 represent independently members selected from the group consisting of alkyl groups having 1 to 5 carbon atoms, cyclobutyl, cyclopentyl, cyclohexyl, phenyl and p-tolyl and (B) at least one compound selected from the group consisting of

(1) TiX_p, XV_p, $Tix_{4-q}(OR^5)_q$, $VOX_{3-r}(OR^5)_r$ and VOX_3 wherein X represents halogen selected from the group consisting of Cl, Br, and I; R^5 represents one member selected from the group consisting of alkyls having 1 to 6 carbon atoms, cyclohexyl, phenyl and p-tolyl; p is an integer of 2 to 4, q is an integer of 1 to 3; r is an integer of 1 to 2; and

(2) The solid compounds obtained by the reaction between one member selected from the group consisting of TiX_4, VX_4, $TiX_{4-q}(OR^5)_q$, $VOX_{3-r}(OR^5)_r$ and VOX_3 and one member selected from the group consisting of $AlR_y^6(OR^7)_wX_{3-y}$, SiR_3^6H, $(R^9HSiO)_s$,

$$R^{10}R^{11}R^{12}SiO—(R^{13}HSiO)_t—SiR^{12}R^{11}R^{10}$$

and a combination of one member selected from SiR_3^6H, $(R^9HSiO)_s$ and $R^{10}R^{11}R^{12}SiO—(R^{13}HSiO)_t—R^{12}R^{11}R^{10}$ and one member selected from $AlCl_3$, $AlBr_3$ and $FeCl_3$ wherein R^5 and X represent independently the same groups as defined above; R^6 and R^7 represent independently the same groups as above-defined R^5; R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} represent independently the same groups as above-defined R^1 or R^2; q and r represent independently the same integers as above-defined; v is an integer of 1 to 3, w is 0 or an integer of 1 to 2, y is an integer of 1 to 3 and $v+w+y=3$; s is an integer of 3 to 6; t is at least one and the viscosity of

$$R^{10}R^{11}R^{12}SiO—(R^{13}HSiO)_t—R^{12}R^{11}R^{10}$$

is at most 2,000 ecntistokes, the mole ratio of the compound (A) to the compound (B) being 0.5–5:1.

3,661,879
PROCESS FOR THE POLYMERIZATION OF N-VINYLCARBAZOLE IN THE PRESENCE OF 2,4,5,7-TETRANITRO-9-FLUORENONE
Max Van Dam, Oradell, and Diana S. Y. Yung, Park Ridge, N.J., assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
No Drawing. Filed Apr. 6, 1971, Ser. No. 131,827
Int. Cl. C08f *7/16*
U.S. Cl. 260—88.3 R 7 Claims

N-vinylcarbazole is polymerized catalytically using 2,4,5,7-tetranitro-9-fluorenone as the polymerization catalyst. The reaction is carried out under elevated temperature conditions. The resulting polymer-fluorenone composition is useful in the preparation of photoconductive plates used in the electrostatic duplicating field.

3,661,880
PROCESS FOR PREPARING SOLID WATER-SOLUBLE CATIONIC POLYMERS
Gerhard Markert, Ober Ramstadt-Eiche, Horst Pennewis and Klaus Ross, Darmstadt, and Dieter Neher, Darmstadt-Eberstadt, Germany, assignors to Rohm Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
No Drawing. Filed May 28, 1969, Ser. No. 828,722
Claims priority, application Germany, June 7, 1968, P 17 70 588.3
Int. Cl. C08f *3/62, 3/90*
U.S. Cl. 260—89.5 N 1 Claim

An improved method for preparing solid water-soluble cationic polymers by polymerizing concentrated aqueous monomer solutions in thin horizontal layers bounded by flexible walls, and then concentrating the resulting polymer solutions by evaporating water directly therefrom to form non-adherent solids easily separable from said walls.

3,661,881
PROCESS FOR PREPARING VINYL CHLORIDE POLYMERS OF REDUCED POROSITY
Donald E. Moore, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation of application Ser. No. 661,206, Aug. 17, 1967. This application Sept. 3, 1970, Ser. No. 69,446
Int. Cl. C08f *1/11, 3/30*
U.S. Cl. 260—92.8 W 5 Claims

This invention is directed to a process for preparing vinyl chloride polymer of reduced porosity in aqueous suspension while in the presence of a monomer-soluble polymerization catalyst and while maintaining an essentially constant reaction temperature. More particularly, the polymerization reaction is continued until a decrease of from about 1 to 20 p.s.i. from the liquid-vapor equilibrium pressure of the reaction occurs. Thereafter, the reduced pressure is maintained by the addition of monomer and polymerizing of the same in contact with the previously formed polymer until a polymer product of lower porosity is obtained.

3,661,882
POLYMERIZATION CATALYST DERIVED FROM ZERO-VALENT STATE METAL COORDINATION COMPLEX WITH GROUP V–A COMPOUND ETC.
John J. Hawkins, Santa Ana, Calif., Charles D. Storrs, Niagara Falls, N.Y., and Stanley D. Zimmerman, Morrisville, Pa., assignors to Columbian Carbon Company
No Drawing. Filed Sept. 5, 1969, Ser. No. 855,753
Int. Cl. C08d *1/14, 3/06*
U.S. Cl. 260—94.3 23 Claims

A catalyst composition is provided which contains a coordination complex of a Group V–A compound such

as triphenyl phosphite and a group zero-valent state metal such as nickel, for example, tetrakis(triphenylphosphite) nickel (O) or bis(triphenylphosphite) nickel (O) dicarbonyl, together with an inorganic Lewis acid such as aluminum chloride, boron trifluoride, or zinc chloride, suitably with a solvent such as tetrahydrofuran, cyclohexane, or methyl chloride, which catalyst is used to polymerize an unsaturated monomer such as butadiene.

3,661,883

PROCESS FOR THE MANUFACTURE OF POLYISOPRENE

Takashi Nishida and Kazuo Itoi, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Okayama Prefecture, Japan

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,748

Claims priority, application Japan, Mar. 1, 1969, 44/15,653; Aug. 13, 1969, 44/64,358

Int. Cl. C08d *3/10, 3/12*

U.S. Cl. 260—94.3 4 Claims

A process for the preparation of polyisoprene containing at least 90% of cis-1,4-configuration comprising contacting isoprene in an inert solvent with a catalyst, characterized in that the said catalyst is prepared by mixing in an inert solvent (a) titanium tetrachloride, (b) an organotin hydride of the general formula, R_mSnH_{4-m}, in which R is a hydrocarbyl group and *m* is an integer of 2 or 3, and (c) an aluminium halide selected from the group consisting of aluminium bromide and aluminium iodide.

3,661,884

REFINING CRUDE AMORPHOUS POLYOLEFINS

Francis J. Shell and Norris D. Zetmeir, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed July 7, 1969, Ser. No. 839,676

Int. Cl. C08f *3/02, 3/08, 15/00*

U.S. Cl. 260—93.7 10 Claims

Crude amorphous polyolefins, by-products of polyolefin production, contain quantities of catalyst residues including discoloring agents such that the crude material is dark, highly viscous-to-solid, flammable and corrosive waste. By treating the crude product in a liquid two-phase purification process, the amorphous polyolefin is separated and recovered as a usable, safe-to-handle, essentially color free, material. The catalyst residue also is recovered.

3,661,885

POLYURETHANE CATALYST

Roy D. Haddick, Ryhope, Karmjit Purewal, Newcastle-upon-Tyne, and Fenwick Vickers, Highfield, Rowlands Hill, England, assignors to Nuodex Limited, Birtey, England

No Drawing. Filed Apr. 22, 1968, Ser. No. 723,247

Claims priority, application Great Britain, May 1, 1967, 20,037/67

Int. Cl. C08g *22/38, 22/40*

U.S. Cl. 260—97.5 AC 12 Claims

As catalysts for polyurethane production these are used, instead of stannous salts as such, complexes of stannous salts with organic complexing agents. Examples are complexes of stannous chloride or, better, stannous octanoate or the like with a ketone, lactone or amine. One advantage of using these complexes is that they have some "delayed action" effect, avoiding premature action without prejudice to their final effectiveness. They may be used in association with known tertiary amine catalysts, or with uncomplexed tin catalysts.

3,661,886

BASIC AZO DYESTUFFS CONTAINING A HETEROCYCLIC QUATERNARY AMMONIUM GROUP

Gert Heger, Schoenenbuch, Switzerland, assignor to Ciba Limited, Basel, Switzerland

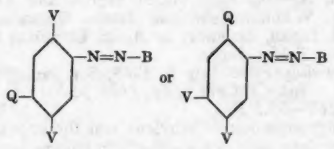
No Drawing. Continuation-in-part of application Ser. No. 657,796, Aug. 2, 1967. This application May 26, 1970, Ser. No. 40,734

Claims priority, application Switzerland, Aug. 5, 1966, 11,331/66; June 21, 1967, 8,815/67

Int. Cl. C09b *29/08, 29/12, 29/36*

U.S. Cl. 260—156 9 Claims

Basic dyestuffs which are free from acidic groups imparting solubility in water and which correspond to the formula



wherein Q is an electronegative group, B is a coupling component, one of V is hydrogen, alkyl, chlorine or bromine and the other a —O— alkyleneamino moiety. The compounds are prepared by coupling, condensation with an amine or hydrazine or by alkylation. They are useful for dyeing synthetic fibers, yielding strong and level dyeings of good general fastness, especially fastness to wet treatments, light and rubbing.

3,661,887

PROCESS FOR CURING SILICONE RUBBER COMPOSITIONS USING HARADA COMPLEXES AS CATALYSTS

John R. Leebrick, Old Lyme, Conn., assignor to Cosan Chemical Corporation, Clifton, N.J.

No Drawing. Continuation-in-part of application Ser. No. 665,981, Sept. 7, 1967. This application May 6, 1970, Ser. No. 35,289

Int. Cl. C08h *9/00*

U.S. Cl. 260—18 S 9 Claims

In a process for curing silicone rubber based on organosiloxane polymers to the solid state, significant improvements are achieved using as the curing catalyst a Harada complex characterized by the empirical formula

in which each of the R groups represent an alkyl group containing 1 to 8 carbon atoms and A represents a carboxylic acid radical containing 1 to 22 carbon atoms.

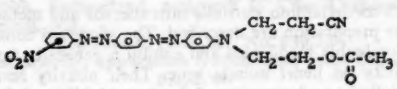
3,661,888

WATER INSOLUBLE DISAZO DYESTUFFS RESULTING FROM COUPLING N,β-ACETOXYETHYL - N,β-CYANOETHYLANILINE AND DIAZOTIZED 4 - AMINO - 2' - OR 4' - NITRO-AZOBENZENE

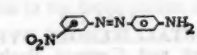
John Sagal, Jr., Rochester, N.Y., assignor to Martin Marietta Corporation

No Drawing. Filed Feb. 12, 1970, Ser. No. 11,025
Int. Cl. C09b *31/04;* D06p *1/06*
U.S. Cl. 260—187 3 Claims

A water insoluble disazo dye of the formula



is prepared by coupling, under acid conditions, equimolar amounts of N,β1acetoxyethyl-N,β-cyanoethylaniline and a diazotized amine of the formula



wherein each NO_2 group is para or meta to the azo group attached to the same phenylene ring as the NO_2 group in question. The dyes may be used as disperse dyes for dyeing polyethylene terephthalate textile fibers to red or orange shades by the conventional thermosol dyeing method, to produce dyeings having excellent light, wash and sublimation fastness.

3,661,889

WATER-INSOLUBLE PHENYL-AZO-PHENYL DYES

Guenter Lange and Hans Guenter Wippel, Ludwigshafen (Rhine), and Rudolf Bermes, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Original application Jan. 10, 1966, Ser. No. 519,425. Divided and this application Feb. 6, 1970, Ser. No. 9,418
Claims priority, application Germany, Jan. 15, 1965, P 15 44 367.1
Int. Cl. C07c *107/06;* C09b *29/08*
U.S. Cl. 260—207.1 3 Claims

Water-insoluble p-aminoazo dyes bearing a phenoxyacetoxyethyl substituent on the amino nitrogen. These dyes are particularly useful for dyeing synthetic linear polyesters.

3,661,890

PREPARATION OF QUERCETIN DERIVATIVES

Leonard Jurd, Berkeley, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Mar. 10, 1970, Ser. No. 18,314
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 F 4 Claims

Process for converting rutin into a 3-O-alkyl quercetin. Example: (a) Rutin is reacted with an excess of benzoyl chloride to benzoylate all the free phenolic hydroxy groups of the rutin, thus to produce 5,7,3',4'-tetra-O-benzoyl rutin. (b) This compound is then hydrolyzed in an acidic medium to split off the rutinoside group while retaining the benzoic acid groups, thus to produce 5,7,3',4'-tetra-O-benzoyl quercetin. (c) This compound is alkylated to produce 3 - O - alkyl - 5,7,3',4' - tetra - O-benzoyl quercetin, which is then (d) hydrolyzed to yield the final product 3-O-alkyl quercetin. Another phase of the disclosure concerns the conversion of rutin into 7-O-benzoyl quercetin. This is accomplished by reacting rutin with benzoyl chloride in the presence of borax to cause selective benzoylation of the rutin in the 7 position. The resulting intermediate (7-O-benzoyl rutin) is then hydrolyzed in an acid medium, yielding the desired end product 7-O-benzoyl quercetin.

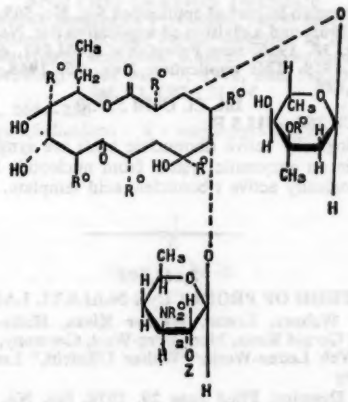
3,661,891

ERYTHROMYCIN UREIDES AND PROCESS OF PREPARATION

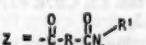
Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Aug. 28, 1970, Ser. No. 67,964
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 E 6 Claims

Erythromycin ureides having the following formula:

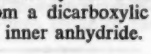


wherein



R^0=CH_3

R=the radical obtained by the removal of the two carboxyl groups from a dicarboxylic acid which can be dehydrated to an inner anhydride.



R'' and R'''=H, alkyl of from 1 to 20 carbon atoms, inclusive, and isomeric forms thereof, cycloalkyl of 3 to 8 carbon atoms, inclusive, and aralkyl of not more than 12 carbon atoms.

Erythromycin ureides are superior tasting erythromycin compounds possessing erythromycin antibacterial activities and the same uses as erythromycin. They also demonstrate a depot effect.

3,661,892

PROCESS FOR THE PRODUCTION OF A NEW ANTIBIOTIC SF–733 SUBSTANCE

Takashi Shomura and Norio Ezaki, Yokohama-shi, Takashi Tsuruoka and Tomizo Niwa, Kawasaki-shi, Eiichi Akita, Tokyo, and Taro Niida, Yokohama-shi, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Dec. 3, 1968, Ser. No. 780,620
Claims priority, application Japan, Dec. 18, 1967, 42/8,060; Oct. 15, 1968, 43/74,634
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 R 1 Claim

A process for the production of an antibiotic SF–733 substance which comprises cultivating SF–733 strain

of *Streptomyces thermoflavus* in an aqueous nutrient medium under submerged aerobic condition and recovering the active ingredient, amorphous free base of SF–733 substance from the medium and more particularly obtaining free base crystal of SF–733 substance by passing said amorphous substance through ethanol-solvate state on the way to crystallization.

3,661,893

SYNTHESIS IN VITRO OF NUCLEIC ACIDS AND PRODUCTS USED THEREIN AND PRODUCTS PRODUCED THEREFROM

Solomon Spiegelman and Ichiro Haruna, Champaign, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of application Ser. No. 509,485, Sept. 29, 1965, and a division of application Ser. No. 535,596, Mar. 18, 1966, now Patent No. 3,444,041, dated May 13, 1969. This application Nov. 25, 1968, Ser. No. 798,528

Int. Cl. C07d *51/50*

U.S. Cl. 260—211.5 R **6 Claims**

Biologically active ribonucleic acids are synthesized in vitro in an enzymatic system from nucleotide bases and a biologically active ribonucleic acid template.

3,661,894

METHOD OF PRODUCING N-ALKYL LACTAMS

Klaus Wehner, Leuna, Werner Kisan, Halle-Neustadt, and Gerald Kunz, Merseburg-West, Germany, assignors to Veb Leuna-Werke "Walter Ulbricht," Leuna, Germany

No Drawing. Filed June 29, 1970, Ser. No. 51,002

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 **8 Claims**

Method of producing a N-alkyl substituted lactam, comprising contacting a N-unsubstituted lactam with a symmetrical dialkyl ether at a temperature of 200 to 400° C. in the presence of a catalyst which catalyzes the splitting off of water.

3,661,895

TEXTILE FIBER SIZING AGENTS

Felix Joseph Germino, Palos Park, Joseph Frank Stejskal, Brookfield, Edwin Hans Christensen, La Grange Park, and Francis Ervin Kite, Riverside, Ill., assignors to CPC International Inc.

No Drawing. Filed Oct. 1, 1969, Ser. No. 862,969

Int. Cl. C13l *1/08*

U.S. Cl. 260—233.5 **23 Claims**

Reaction of a cross-linked, thin-boiling starch with a polycarboxylic anhydride yields an effective warp size composition.

3,661,896

AZATRICYCLIC LACTAMS

Gilbert H. Berezin, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Division and Continuation-in-part of application Ser. No. 775,114, Nov. 12, 1968. This application Aug. 21, 1970, Ser. No. 66,097

Int. Cl. C07d *41/00*

U.S. Cl. 260—239.3 **2 Claims**

This invention relates to the novel compounds 4-azatricyclo[4.3.1.1^{3,8}]undecane - 5 - one and 4 - azatricyclo [5.3.1.1^{3,9}]dodecane-5-one and the methods of preparing said compounds.

3,661,897

18-AMINO-PREGNANES

Ulrich Eder, Hans-Detlef Berndt, Ulrich Kerb, Rudolf Wiechert, and Georg Zollner, Berlin, Germany, and Paul Buchschacher, Arlesheim, Andre Furlenmeier and Andor Furst, Basel, and Marcel Muller, Frenkendorf, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,538

Claims priority, application Germany, Apr. 17, 1969, P 19 20 151.5

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.55 R **19 Claims**

13-methylamino steroids, salts thereof and methods for their preparation are described. The aforesaid compounds are valuable medicinals and exhibit a generally favorable activity on heart muscle tone. Their activity results especially in an increasing of the expandability of the heart muscle fibers and thus facilitates, for example, makes possible a sufficient blood filling of the heart.

3,661,898

METALLIFEROUS DYES

Johannes Dehnert and Gerhard Bachmann, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed July 23, 1969, Ser. No. 844,210

Claims priority, application Germany, July 24, 1968, P 17 70 959.0

Int. Cl. C07d *33/50*

U.S. Cl. 260—240 G **2 Claims**

Metalliferous azomethines prepared from 2-(8-aminoquinonyl-(2)-)-indandione-(1,3) and ortho-hydroxyaldehydes which contain copper or nickel as the metal. These compounds are valuable pigment dyes.

3,661,899

2(5H)-FURANONE COMPOUNDS

John A. Ford, Jr., and Charles V. Wilson, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 870,437, Nov. 12, 1969, which is a division of application Ser. No. 555,240, June 6, 1966. This application June 1, 1970, Ser. No. 42,535

Int. Cl. C09b *23/00;* C07d *5/10*

U.S. Cl. 260—240 **12 Claims**

Certain 2(5H)-furanone compounds are described and claimed. These compounds, depending on their particular structure, are textile dyes, sensitizers for organic photoconductors in electrophotography, ultraviolet absorbers, for example, for linear condensation polymers or useful for the heat stabilization of polyesters, such as poly-(ethylene terephthalate). Some of the compounds have more than one of the utilities just mentioned. 3-cyano-5-orthonitrobenzylidene - 4 - phenyl - 2(5H) - furanone and 3 - cyano-5-dimethylaminomethylidene-4-phenyl-2-(5H)-furanone are illustrative of 2(5H)-furanone compounds.

3,661,900

2-(2',6'-DICHLOROPHENYL)-1,3-THIAZINE-4-ONE

Jasper Daams and Kobus Wellinga, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed June 3, 1970, Ser. No. 43,194

Claims priority, application Netherlands, June 4, 1969, 6908457

Int. Cl. C07d *93/06*

U.S. Cl. 260—243 R **1 Claim**

It has been found that 2-(2',6'-dichlorophenyl)-1,3-thiazine-4-one has a biocidal effect on plants and their seeds. An interesting feature is that the said novel substance has not only a good initial activity but also a long-term activity. Selective use of the substance in culti-

vated plants having roots which penetrate to a comparatively great depth is possible. Thus, no appreciable damage is done to the cultivated plants.

3,661,901

HEAVY METAL COMPLEXES OF CEPHALOSPORIN C AND PROCESS FOR THE ISOLATION OF CEPHALOSPORIN C IN THE FORM OF SUCH COMPLEXES

Hans Bickel, Binningen, Rolf Bosshardt, Arlesheim, Bruno Fechtig, Reinach, Walter Voser, Allschwil, Johannes Mueller, Arlesheim, and Heinrich Peter, Riehen, Switzerland, assignors to Ciba Corporation, Summit, N.J.

Filed June 4, 1969, Ser. No. 830,334
Claims priority, application Switzerland, June 14, 1968, 8,835/68
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C 12 Claims

Sparingly soluble microcrystalline heavy metal complexes of cephalosporin C and a process for isolating cephalosporin C in the form of such complexes from solutions obtainable in the fermentation of cephalosporin C.

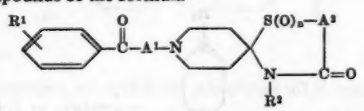
3,661,902

N-SUBSTITUTED PIPERIDINE SPIRO COMPOUNDS

Michio Nakanishi, Oita, a ndKatsuo Arimura and Tadao Okada, Fukuoka, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 752,497, Aug. 14, 1968. This application Sept. 2, 1970, Ser. No. 69,154
Claims priority, application Japan, Aug. 16, 1967, 42/52,529
Int. Cl. C07d *29/20, 93/06*
U.S. Cl. 260—243 R 15 Claims

Compounds of the formula



and pharmaceutically acceptable acid addition salts thereof are antipsychotic agents, useful in the therapy of schizophrenia and mania. In the formula

R^1=H, halogen, lower alkyl or lower alkoxy;
R^2=H, lower alkyl, phenyl, halophenyl, methylphenyl or trifluoromethylphenyl;
A^1=alkylene of 1 to 3 carbon atoms;
A^2=alkylene of 1 to 2 carbon atoms; and
n=0, 1 or 2.

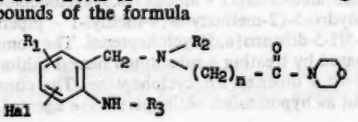
3,661,903

HALO-SUBSTITUTED 2-AMINO-BENZYLAMINE-MORPHOLIDES AND SALTS THEREOF

Gerd Kruger, Biberach (Riss), Otmar Zipp, Osnabruck, and Johannes Keck, Josef Nickl, Hans Machleidt, Gerhard Ohnacker, Robert Engelhorn, and Sigfrid Puschmann, Biberach (Riss), Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

No Drawing. Continuation-in-part of application Ser. No. 872,778, Oct. 30, 1969, which is a continuation-in-part of application Ser. No. 555,696, June 7, 1966. This application Nov. 12, 1970, Ser. No. 88,985
Claims priority, application Germany, June 9, 1965, T 28,754
Int. Cl. C07d *87/42*
U.S. Cl. 260—247.2 A 6 Claims

Compounds of the formula



wherein

Hal is chlorine or bromine,
R_1 is hydrogen, chlorine or bromine,
R_2 is alkyl of 1 to 4 carbon atoms, phenyl or benzyl,
R_3 is hydrogen, alkanoyl of 2 to 4 carbon atoms, benzoyl, cholorobenzoyl, methoxybenzoyl, nicotinoyl or isonicotinoyl, or
n is 1 or 2,

and non-toxic, pharmacologically acceptable acid addition salts thereof; the compounds as well as their salts are useful as antitussives and respiration-stimulants.

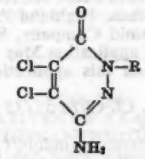
3,661,904

2-ALKYL-4,5-DICHLORO-AMINOPYRIDAZONES-3 AND PREPARATION THEREOF

Masao Iizuki, Kanagawa Prefecture, Norio Igari, Tokyo, and Shinya Ito, Kyoto, Japan, assignors to Hodogaya Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed May 7, 1970, Ser. No. 35,567
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 7 Claims

2-alkyl-4,5-dichloro - 6 - aminopyridazones-3 of the formula:



wherein R is an alkyl group having 1 to 4 carbon atoms are intermediates for the production of monoazo dyestuffs having an affinity to metal-containing polyolefins and polyesters. These compounds are prepared by nitrating the corresponding 2-alkyl-4,5-dichloro-pyridazones-3 and reducing the 6-nitro group of the intermediate to an amino group.

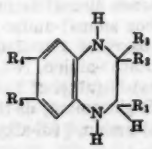
3,661,905

TETRAHYDROQUINOXALINE DERIVATIVES

Kurt Ley, Odenthal-Globusch, Roland Nast, Cologne-Buchheim, Wolfgang Redetzky, Opladen-Quettingen, and Theo Kempermann, Cologne-Lindenthal, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 10, 1969, Ser. No. 856,796
Claims priority, application Germany, Sept. 13, 1968, P 17 95 325.2, P 17 95 326.3
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 10 Claims

The present invention relates (1) to rubber products that are unaffected by ozone (2) to anti-ozonants that may be used in the production of these ozone-resistant rubber products, and (3) to the preparation of these anti-ozonants corresponding to the general formula:



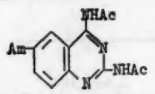
3,661,906

2,4-DIACYLAMINO-6-AMINO-QUINAZOLINES

Paul Schmidt, Therwil, and Christian Egli, Rheinfelden, Switzerland, assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed Oct. 22, 1969, Ser. No. 868,591
Claims priority, application Switzerland, Nov. 13, 1968, 16,921/68
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.4 Q 6 Claims

Compounds of the formula



in which Ac stands for an acyl group, Am for an optionally substituted amino group, and which may be substituted in the benzene ring in positions 5,7 or 8 are useful as hypotensive and diuretic agents.

3,661,907

5-BENZ (cd)-INDOL-2(1H)-YLIDENE-BARBITURIC ACID

Thurairajah Padmanathan, Highland Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application May 27, 1968, Ser. No. 732,045. Divided and this application Oct. 21, 1970, Ser. No. 82,821
Int. Cl. C07d *51/33*
U.S. Cl. 260—256.4 C 1 Claim

The compound 5-benz(cd)indol-2(1H)-ylidene-barbituric acid, which is useful as a dye for synthetic fibers. The compound is also useful as an intermediate in the synthesis of 1,3,2-oxazaborinide compounds.

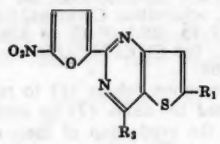
3,661,908

2-(5'-NITRO-2'-FURYL)-4-AMINO-THIENO[3,2-d] PYRIMIDINES AND SALTS THEREOF

Eberhard Woitun and Wolfgang Reuter, Biberach (Riss), Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim/Rhein, Germany

No Drawing. Filed Nov. 18, 1970, Ser. No. 90,841
Claims priority, application Germany, Nov. 26, 1969, P 19 59 403.7; Oct. 16, 1970, P 20 50 814.9, P 20 50 815.0, P 20 50 816.1
Int. Cl. C07d *99/06*
U.S. Cl. 260—256.5 R 11 Claims

Compounds of the formula



wherein

R_1 is hydrogen or methyl, and

R_2 is amino, (alkyl of 1 to 5 carbon atoms)-amino, di-(alkyl of 1 to 4 carbon atoms)-amino, (monohydroxy-alkyl of 2 to 5 carbon atoms)-amino, (2,3-dihydroxy-n-propyl)-amino, (alkoxy of 1 to 2 carbon atoms-alkyl of 1 to 3 carbon atoms)-amino, N-(ω-hydroxy-alkyl of 2 to 3 carbon atoms)-N-(alkyl of 1 to 4 carbon atoms)-amino, N-methyl-D-glucamino, di-(hydroxy-alkyl of 1 to 5 carbon atoms)-amino, [(di-alkyl of 1 to 2 carbon atoms)-amino-alkyl of 2 to 3 carbon atoms]-amino, (1-methyl-2-hydroxy-ethyl)-amino, (2-phenyl-2-hydroxy-ethyl)-amino, (2 - hydroxy-3-diethylamino-n-propyl)-amino, (alkanoyl of 1 to 2 carbon atoms)-amino, chloroacetyl - amino, dichloroacetyl - amino, (amino-alkyl of 2 to 3 carbon atoms)-amino, (acetyl-amino-alkyl of 2 to 3 carbon atoms)-amino, allylamino, anilino, chloroanilino, methylanilino, hydroxyanilino, methoxyanilino, N-methyl-anilino, benzylamino, phenethyl-amino, cyclohexyl-amino, (hydroxy-cyclohexyl)-amino, pyrrolidino, piperidino, hydroxy-piperidino, morpholino, thiomorpholino, thiomorpholino-1-oxide, piperazino, N - methyl - piperazino, N-hydroxyethyl-piperazino, N-formyl-piperazino or N-carbethoxy-piperazino,

and non-toxic, pharmacologically acceptable acid addition salts thereof; the compounds as well as their salts are useful as bactericidal agents against grampositive and gramnegative bacteria, as fungicides and as trichomonacides, especially against Trichomonas vaginalis, in warm-blooded animals.

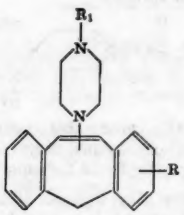
3,661,909

5H-DIBENZO (a,d) CYCLOHEPTEN-10-YL-PIPERAZINES

Michele Mastursi, Naples, Sabino Lembo, Pozzuoli, and Rene Viterbo, Naples, Italy, assignors to Richardson-Merrell S.p.A., Naples, Italy

No Drawing. Original application Mar. 25, 1968, Ser. No. 715,536, now Patent No. 3,575,980. Divided and this application Feb. 2, 1971, Ser. No. 112,042
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR 3 Claims

New en-amines of the formula:



in which R may be hydrogen, halogen, or lower alkyl, and R_1 represents a nitrogen-containing substituent, preferably a cyanethyl or picolyl. These new compounds are useful because of their pharmacological, activities which include muscle relaxing, anti-inflammatory, anti-pyretic, analgesic, and sedative action. A preferred method of making the new compounds is described.

3,661,910

5-(SUBSTITUTED-BENZYL)-DIBENZO[a,d] CYCLOHEPTENES

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Parsippany, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Oct. 13, 1969, Ser. No. 866,011
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR 13 Claims

5-(substituted-benzyl) - dibenzo[a,d]cycloheptenes e.g. 10,11-dihydro-5-(2-methoxy-α-[4-methyl-1 - piperazinyl] benzyl)-5H-5-dibenzo[a,d]cycloheptenol. The compounds are prepared by treating a substituted benzyl lithium compound with a dibenzo[a,d]cycloheptene. The compounds are useful as hypotensive/antihypertensive agents.

3,661,911

MONO, DI, AND TRI PYRIDINE COMPLEXES OF ORGANOTIN COMPOUNDS

Holger Meyer, Bromma, Sweden, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 21, 1966, Ser. No. 595,599
Claims priority, application Sweden, Nov. 23, 1965, 15,124/65
Int. Cl. C07d *31/26*
U.S. Cl. 260—270 R 2 Claims

The compounds are of the class of organotin complexed with one to three moles of pyridine, useful as pesticides. This class is exemplified by the dipyridine complex of bis-(dibromocyclohexyl)-diphenyltin.

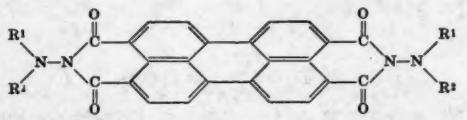
3,661,912

BIS(N-ACYLAMINO) DERIVATIVES OF PERYLENE TETRACARBOXYLIC ACID IMIDES

Dietmar Kalz, Leverkusen, and Gerhard Wolfrum, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 26, 1968, Ser. No. 755,438
Claims priority, application Germany, Aug. 31, 1967, P 15 69 754.8, P 15 69 755.9, P 15 69 756.0; Oct. 10, 1967, F 53,721, F 53,722, F 53,723; Oct. 24, 1967, P 16 69 760.6
Int. Cl. C07d *39/00*
U.S. Cl. 260—281 7 Claims

A perylene series dyestuff of the formula:

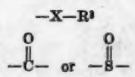


wherein:

R^1 is hydrogen, an optionally substituted alkyl, cycloalkyl, aralkyl, or aryl group;

R^2 is a optionally substituted alkyl, cycloalkyl, aralkyl or aryl group, or an alkoxy carbonyl group, or a heterocyclic radical;

or a radical of the formula:



wherein

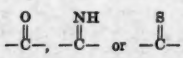
X is

and R^3 is an optionally substituted alkyl, cycloalkyl, aralkyl, aryl or heterocyclic radical;

or a radical of the formula:

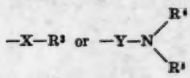
wherein

Y is



and R^4 and R^5 are hydrogen or optionally substituted alkyl groups, cycloalkyl groups, aralkyl groups or aryl groups;

wherein the perylene radical can have further substituents; with the proviso that when R^2 is



then R^1 is hydrogen.

3,661,913

8-LOWER ALKOXYISOQUINOLINIUM HALIDES

Willy Leimgruber, Montclair, and Fausto Eugenio Schenker, Bloomfield, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Aug. 30, 1967, Ser. No. 664,269, now Patent No. 3,562,280, dated Feb. 9, 1971. Divided and this application Sept. 9, 1970, Ser. No. 70,923
Int. Cl. C07d *35/10*
U.S. Cl. 260—286 Q 4 Claims

Novel pharmacologically active 8-(lower alkoxy)-1,2,3,4-tetrahydroisoquinolines, 8-(lower alkoxy)-1 and/or 2-(lower alkyl)-1,2,3,4-tetrahydroisoquinolines and intermediates therefor, are prepared utilizing, for example, 8-isoquinolinol as a starting material. The pharmacologically active compounds of the invention are useful as hypotensive agents.

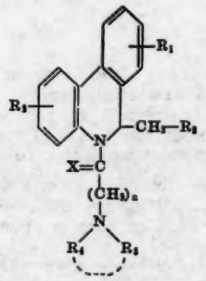
3,661,914

DERIVATIVES OF 5,6-DIHYDRO-PHENANTHRIDINE

Willem Jacob van der Burg, Heesch, Netherlands, assignor to Organon Inc., West Orange, N.J.

No Drawing. Filed July 1, 1969, Ser. No. 838,732
Claims priority, application Netherlands, Aug. 21, 1968, 6811947
Int. Cl. C07d *39/02*
U.S. Cl. 260—287 R 2 Claims

Novel phenanthridine derivatives having the general formula:



in which

R_1 and R_2 are a member of the group consisting of hydrogen, halogen, hydroxy, amino, acyloxy, alkyl and alkoxy with 1–6 C-atoms.

R_3 is a member of the group consisting of hydrogen, hydroxy, alkoxy, and alkyl with 1–6 C-atoms, and halogen,

X is a member of the group consisting of hydrogen (H_2) and oxygen,

$(CH_2)_n$ is a member of the group consisting of a branched and an unbranched alkylene group with 1–6 C-atoms,

R_4 and R_5 are a member of the group consisting of hydrogen and an alkyl group with 1–6 C-atoms, and together

with the nitrogen atom a member of the group consisting of a saturated and an unsaturated heterocyclic ring system,

and the acid addition salt and quaternary ammonium compounds thereof.

3,661,915
1-HYDROXYBENZO[b]QUINOLIZINE DERIVATIVES

John T. Suh, Mequon, and Richard A. Schnettler, Brown Deer, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 767,479, Oct. 14, 1968. This application Sept. 2, 1970, Ser. No. 69,140

Int. Cl. C07d *39/12*

U.S. Cl. 260—289 R **4 Claims**

The compounds are 1-hydroxybenzo[b]quinolizines which are useful as agents to control aggressive anti-social behavior in animals. The compounds also may be used as intermediates in the preparation of pickling agents, mothproofing agents and wood preservatives. Representative of compounds disclosed are cis-8,9-dimethoxy-1-hydroxy-1,3,4,6,11,11a-hexahydro - 2H - benzo[b]quinolizine and 8,9 - dimethoxy - 1 - hydroxy - 1 - (3 - chlorobenzyl)-1,3,4,6,11,11a-hexahydro-2H-benzo[b]quinolizine.

3,661,916
THIOCARBOXYLIC ACID ESTERS OF 8-AZA-BICYCLO[3.2.1]OCTANES AND 9 - AZA-BICYCLO[3.3.1]NONANES

Elmar Sturm, Arlesheim, Basel-Land, and Christian Vogel, Binningen, Basel-Land, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

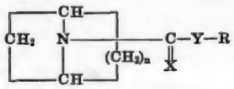
No Drawing. Filed July 20, 1970, Ser. No. 56,687

Claims priority, application Switzerland, Aug. 1, 1969, 11,725/69

Int. Cl. C07d *39/00*

U.S. Cl. 260—292 **7 Claims**

Compounds of the formula



wherein

R represents lower alkyl, lower halogenalkyl, lower alkenyl or lower halogenalkenyl,

n represents the integer 0 or 1 and

of the symbols X and Y, one represents sulphur and the other represents oxygen or sulphur

are disclosed as herbicidally active substances. Compositions as well as a method for controlling weeds and wild grasses with the aid of such compounds are also described.

3,661,917
3-SULFONAMIDO-4-HYDROXYPHENYL-2-PIPERIDYLCARBINOLS

Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 39,561, May 21, 1970. This application Mar. 26, 1971, Ser. No. 128,566

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.73 **10 Claims**

3-sulfonamido - 4 - hydroxyphenyl-2-piperidylcarbinols prepared by appropriate reduction of 2-pyridylcarbinols or ketones have β-adrenergic stimulant activity. Erythro and threo diastereoisomers may be conveniently separated.

3,661,918
PROCESS FOR THE PREPARATION OF BICYCLIC AMINES

Constantine J. Bouboulis, Union, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Oct. 17, 1968, Ser. No. 768,540

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.52 **11 Claims**

Substituted bicyclic amine compounds such as substituted 1-aza bicyclo[3,3,1]nonanes are synthesized through the catalytically promoted hydrogenation of triamino compounds, ketodiamino compounds, trinitrile compounds and keto-dinitrile compounds. The starting trinitrile and keto-dinitrile compounds are desirably produced by cyanoethylating either a ketone or a mononitrile compound. The triamino and keto-diamino materials are obtained by hydrogenation of the nitrile compounds. The substituted bicyclic amine compositions are useful as agricultural chemicals and as additives or additive precursors for hydrocarbon compositions ranging from gasoline fractions through middle distillate fuels and lubricating oils.

3,661,919
TETRAHYDROPYRIDYL-5-RESORCINOLS

Raj K. Razdan, Belmont, Mass., William R. Thompson, Ithaca, N.Y., and Felix E. Granchelli, Arlington, and Harry G. Pars, Lexington, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

No Drawing. Filed Mar. 27, 1969, Ser. No. 811,701

Int. Cl. C07d *29/38*

U.S. Cl. 260—297 R **5 Claims**

New 2-R_2-5-alkyl-resorcinols having anti-bacterial and anti-fungal activity.

3,661,920
PHENYL-THIAZOLE-MALONIC ACID DERIVATIVES

Walter Hepworth and Gilbert Joseph Stacey, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

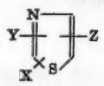
No Drawing. Filed Feb. 17, 1969, Ser. No. 799,963

Claims priority, application Great Britain, Mar. 22, 1968, 13,989/68

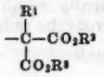
Int. Cl. C07d *91/32*

U.S. Cl. 260—302 R **6 Claims**

Thiazole derivatives of the formula:



wherein Y or Z is linked to the 2-position of the thiazole nucleus, X stands for hydrogen or alkyl of up to 3 carbons, Y stands for a phenyl radical and Z stands for a group of the formula:



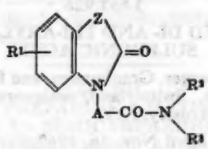
wherein R^1 stands for hydrogen, alkali metal, alkyl of not more than 3 carbons, dialkylaminomethyl of not more than 5 carbons, N-piperidinomethyl or N-morpholinomethyl, chlorine or bromine, and R^2 and R^3, stand for hydrogen or alkyl radical of not more than 3 carbons, provided that when R^2 and R^3 stand for hydrogen, R^1 stands for hydrogen or an alkyl radical of not more than 3 carbon atoms, and non-toxic pharmaceutically-acceptable salts thereof. These phenyl-thiazole-malonic acid derivatives possess anti-inflammatory, analgesic and anti-pyretic activity. Processes for preparing these compounds, and pharmaceutical compositions containing the same are disclosed. A typical compounds is diethyl 4-(4-bromophenyl)thiazol-2-ylmalonate.

3,661,921
N-SUBSTITUTED AND N,N - DISUBSTITUTED AMINOCARBONYLALKYL COMPOUNDS AND THEIR PRODUCTION

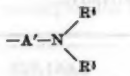
Suminori Umio, Kawanishi-shi, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka-shi, Japan

No Drawing. Continuation-in-part of application Ser. No. 733,828, June 3, 1968. This application Apr. 1, 1969, Ser. No. 812,448
Claims priority, application Japan, June 5, 1967, 42/36,113; Sept. 30, 1967, 42/62,872
Int. Cl. C07d *91/16, 49/34*
U.S. Cl. 260—304 29 Claims

N-substituted and N,N - disubstituted aminocarbonylalkyl compounds of the formula:



wherein Z is sulfur or lower alkylamino, A is lower alkylene, R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl, R^2 is hydrogen, lower alkyl or hydroxy (lower)alkyl and R^3 is hydrogen, lower alkyl, halo(lower) alkyl, hydroxy(lower)alkyl, lower alkoxy(lower)alkyl, hydroxy(lower)alkoxy(lower)alkyl, hydroxycarbonyl(lower)alkyl, lower alkoxycarbonyl(lower)alkyl, phenyl bearing or not one or more of lower alkyl, halogen, hydroxyl, lower alkoxy and lower alkanoyl, phenyl(lower)alkyl having or not on the benzene ring one or more of lower alkyl, halogen, hydroxyl, lower alkoxy and lower alkanoyl, or the group of the formula:



in which A' is lower alkylene and R^4 and R^5 are each lower alkyl or phenyl or, when taken together with the adjacent nitrogen atom, represent a 5 to 7-membered nitrogen containing heterocyclic group, or the group of the formula:

may represent a 3 to 7-membered heterocyclic group, provided that R^1 is not hydrogen when R^2 and R^3 are each lower alkyl or, in the linked form, represent a lower alkylene group or an oxa(lower)alkylene group and R^1 is not chlorine when both R^2 and R^3 are hydrogen. These compounds exhibit pharmacological activity such as antiinflammatory activity or antiarrhythmic activity.

3,661,922
PROCESS FOR PURIFICATION OF VINYL OXAZOLINES

John A. Frump and Wallace F. Runge, Terre Haute, Ind., assignors to Commercial Solvents Corporation

No Drawing. Filed June 15, 1970, Ser. No. 46,496
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 F 5 Claims

A process for the separation of a mixture of a vinyl oxazoline containing the corresponding oxazoline as an impurity of the steps of reacting the oxazoline with formaldehyde to form the water-soluble 2-alkyl or alkenyl-[1,1-bis(hydroxymethyl)] derivative, then separating it by extraction with water.

3,661,923
POLYFUNCTIONAL POLYOL ESTER OXAZOLIDINES

William D. Emmons, Huntingdon Valley, and Jerome F. Levy, Dresher, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Oct. 18, 1968, Ser. No. 768,906
Int. Cl. C07d *85/26*
U.S. Cl. 260—307 F 8 Claims

Polyfunctional polyol ester oxazolidines of the general formula

where

n is an integer of two to four;

Z_1 is an alkylene radical or a tri- or tetravalent hydrocarbon radical

X is the radical

where *m* is an integer of 2 to 4 and R^5 and R^6 are selected from H and $(C_1–C_6)$alkyl or a mixture thereof; R^1 and R^2 are selected from the group consisting of

(1) separate groups selected individually from
  (a) hydrogen, phenyl, benzyl, and $(C_1–C_{12})$alkyl groups in the case of R^1 and
  (b) hydrogen and $(C_1–C_4)$alkyl groups in the case of R^2 and
(2) a single group selected from the group consisting of pentamethylene and tetramethylene which together with the carbon atom to which the group is attached forms a carbocyclic group;

Y is the radical

where *m'* is an integer of 2 to 3 and R^3 and R^4 are selected from H, $(C_1–C_{12})$alkyl, aryl and alkaryl,

produced by means of a transesterification process are useful for formulating adhesives, caulks, lacquers, paints, varnishes, leather impregnants and moisture-cured coating systems.

3,661,924
DERIVATIVES OF N-ALKYNYLTRIHALOGENIMIDAZOLE AS ACTIVE SUBSTANCES IN AGENTS FOR COMBATING ECTOPARASITES

Henry Martin, Basel, Switzerland, and Georg Pissiotas, Lorrach, Germany, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Oct. 7, 1969, Ser. No. 864,542
Claims priority, application Switzerland, Oct. 17, 1968, 15,559/68
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 6 Claims

The invention comprises N-alkynyl-2,3,5 trihalogenimidazoles and their use as active ingredients in preparations for combating ectoparasites.

3,661,925

PROCESS FOR THE PREPARATION OF 2-BENZIMIDAZOLECARBOXAMIDES

Ronald J. McCaully, Malvern, and Carl Gochman, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed May 15, 1970, Ser. No. 37,909

Int. Cl. C07d 49/38

U.S. Cl. 260—309.2 4 Claims

This invention relates to substituted 2-benzimidoazolecarboxamides and to processes for their production comprising the reaction of a 2,2-dihydroxyacetamide, dialkanoate with an o-phenylenediamine. The compounds are pharmacologically active as central nervous system depressant agents.

3,661,926

PHYSIOLOGICALLY ACTIVE OXADIAZOLINE AND THIADIAZOLINE DERIVATIVES OF PHOSPHORIC ACID AND THIOPHOSPHORIC ACID

Bernardus Gerhardus Van Den Bos, Jacques Meltzer, and Martin Jacob Handele, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

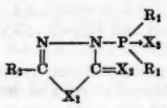
No Drawing. Filed Oct. 14, 1968, Ser. No. 767,461

Claims priority, application Netherlands, Oct. 16, 1967, 6714053

Int. Cl. C07d 85/54

U.S. Cl. 260—307 A 5 Claims

Oxadiazoline or thiadiazoline derivatives of phosphoric or thiophosphoric acid of the formula



wherein X_1, X_2 and X_3 are oxygen and sulfur and R_1 and R_2 are organic moieties. These compounds are useful as insecticides and acaracides. An example is [5-(p-chlorophenyl) - 1,3,4 - oxadiazolone (2)] bis(dimethylamido) phosphoric acid.

3,661,927

2-IMIDAZOLIN-2-YL ALKYLENE DERIVATIVES OF BENZAZOCINES AND BENZOTHIAZOCINES

Dusan Zivkovic, Brussels, Belgium, assignor to UCB Société Anonyme, Brussels, Belgium

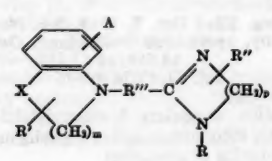
No Drawing. Filed Feb. 5, 1969, Ser. No. 796,920

Claims priority, application Great Britain, Feb. 7, 1968, 6,049/68

Int. Cl. C07d 49/34, 51/36

U.S. Cl. 260—309.6 11 Claims

Heterocyclic compounds with anti-arrhythmic, psychostimulant, antispasmodic, cardiovascular, antidepressive and antihistaminic properties having the formula



wherein

A is hydrogen, halogen, cyano, alkyl, alkoxy, acyl or haloalkyl,

X is methylene or sulfur,

R, R′, R″ are each hydrogen or alkyl,

R‴ is a straight or branched chain alkylene radical having 1 to 4 carbon atoms,

m is a whole number from 2 to 4, and

p is a whole number from 2 to 5,

the pharmaceutically acceptable acid addition salts thereof, and methods for preparing the same.

3,661,928

HALOGENATED DI- AND TRI-ARYL-PYRAZOLINE SULPHONIC ACIDS

Siegfried Rosenberger, Graubunden, and Heinrich Häusermann, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Nov. 16, 1967, Ser. No. 683,486

Claims priority, application Switzerland, Nov. 21, 1966, 16,668/66

Int. Cl. C07d 49/10

U.S. Cl. 260—310 D 2 Claims

Novel halogenated 1,3-diaryl- and 1,3,5-triaryl-pyrazolines which bear a sulfonic acid group in p-position and a single fluorine, chlorine or bromine atom, in m-position, at the phenyl-substituent in 1-position at the pyrazoline nucleus are described as useful for the optical brightening of polyamide fiber materials on which they cause unexpectedly no greenish or undesirably strong reddish hue even when applied in larger concentrations, e.g. of up to 1% of pyrazoline derivative.

3,661,929

DIIODOMETHYLATE 1,2 - BIS(4′-PYRROLYDINOMETHYL-1′,3′-DIOXOLANYL-2′) ETHANE

Solomon Aronovich Giller, Ulitsa Pernavas 101, kv. 76; Georgy Petrovich Sokolov, Ulitsa Avotu 28, kv. 3; and Agris Adolfovich Kimenis, Ulitsa Revoljutsii 10, kv. 30/31, all of Riga, U.S.S.R.; and Via Ekabovna Klusha, St. Maiory, ulitsa Dauku 11, Jurmala, Latviiskoi, U.S.S.R.

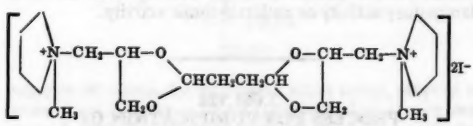
No Drawing. Filed May 7, 1969, Ser. No. 822,698

Claims priority, application U.S.S.R., May 12, 1968, 1,239,904

Int. Cl. C07d 27/02

U.S. Cl. 260—326.5 D 1 Claim

The diiodomethylate of 1,2-bis-(4′-pyrrolydinomethyl-1′,3′-dioxolanyl-2′) ethane of the following formula



is used as the active ingredient in a pharmaceutical composition of curare-like action.

The process for the preparation of the above product consists in reacting 1,2-bis(4′-chloromethyl-1′,3′-dioxolanyl-2′) ethane with pyrrolydine at a temperature not higher than 150° C. and a subsequent liberation of the obtained base—1,2-bis(4′-pyrrolydinomethyl-1′,3′-dioxolanyl-2′) ethane; treatment of the latter with methyl iodide in an organic solvent resulting in formation of the final product.

3,661,930

1,4-DITHIACYCLOHEPTYLIDEN-6-IMINYL CARBAMATES

Ranajit Ghosh, Nigel Douglas Bishop, and Frederick Charles Peacock, Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Dec. 2, 1968, Ser. No. 780,590
Claims priority, application Great Britain, Dec. 4, 1967, 55,062/67
Int. Cl. C07d *75/00*
U.S. Cl. 260—327 R 3 Claims

Carbamoyloximes and pesticidal compositions containing the same. The carbamoyloxides are made by reacting the appropriate ketone with hydroxylamine and carbamoylating the resulting oxime. Representative products are 1,4-dithiacycloheptyliden-6-iminyl N-methyl-carbamate and 1,4-dithia-5,5-dimethylcycloheptyliden-6-iminyl N-methyl-carbamate.

3,661,931

PROCESS FOR PREPARING 1-METHYL-2,3,5,6-TETRAHYDRO - 5 - SEMICARBAZIDO-6-HYDROXY-INDOLE - 3 - SULPHONIC ACID AND ALKALI METAL SALTS THEREOF

Giorgio Giommoni, Via Massena 2/A, Milan, Italy

No Drawing. Filed June 11, 1969, Ser. No. 832,474
Claims priority, application Italy, June 25, 1968, 18,183/68
Int. Cl. C07d *27/34*
U.S. Cl. 260—326.11 9 Claims

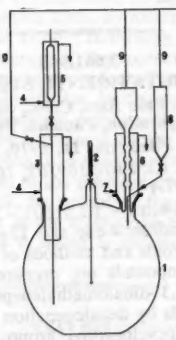
A process for preparing 1-methyl-2,3,5,6-tetrahydro-5-semicarbazido-6-oxo - indole - 3 - sulphonic acid wherein adrenaline is reacted with an aqueous solution of alkali metal sulphite to obtain a compound which is then treated with a moderate oxidizing agent and semicarbazide to give the alkali metal salt of 1-methyl-2,3,5,6-tetrahydro-5-semicarbazido-6-oxo-indole-3-sulphonic acid from which the free acid is obtained by acidifying the aqueous solution of said salt.

3,661,932

PROCESS FOR THE PREPARATION OF 1,3,5-TRIOXANE

Gianfranco Pregaglia, Milan, and Marco Agamennone and Luigi Cavalli, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 1, 1967, Ser. No. 635,250
Claims priority, application Italy, May 5, 1966, 10,175/66
Int. Cl. C07d *19/00*
U.S. Cl. 260—340 4 Claims



Increasing the productivity of the reaction in the preparation of 1,3,5-trioxane from a concentrated formaldehyde solution containing a strong acid by including in the solution from about 5 to 15 grams per 100 cc. of solution of a soluble acid salt of aluminum or of a monovalent or a bivalent metal selected from the group I–A, II–A and II–B metals, Mn, Fe, Co and Ni, the salt being of an acid having a pKa lower than 2.

3,661,933

LEVOPIMARIC ACID EPOXYPEROXIDE

Walter H. Schuller, Lake City, Fla., Hideo Kanno, Tokyo, Japan, and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,504
Int. Cl. C07d *11/00*
U.S. Cl. 260—340.3 2 Claims

Levopimaric acid epoxytransannular peroxide and the methyl ester of this compound were prepared by mixing about 1:1 molar ratio of the levopimaric acid transannular peroxide with an epoxidizing agent (or methyl levopimarate transannular peroxide to produce the methyl ester) such as meta-chloroperbenzoic acid, peracetic acid, permaleic acid, and the like, in organic solvent, refluxing the mixture until epoxidation is complete, washing the product with aqueous base to remove unreacted impurities, and finally recrystallizing the product from a suitable organic solvent.

3,661,934

PROCESS FOR PREPARING 2-(DIETHYLAMINO)-ETHYL TETRAHYDRO - α - (1 - NAPHTHYL-METHYL)-2-FURANPROPIONATE

Harold Berman, Norwich, N.Y., assignor to Norton-Norwich Products, Inc.

No Drawing. Filed Oct. 9, 1969, Ser. No. 865,159
Int. Cl. C07d *5/04*
U.S. Cl. 260—347.5 1 Claim

An improved process for preparing the titled compound is provided which comprises (a) catalytic reduction of ethyl-2-aceto-3-(2-furyl)acrylate to ethyl tetrahydro-α-acetyl-2-furanpropionate, (b) reaction of the product of (a) with 1-chloromethylnaphthalene in the presence of an alkali metal alkoxide to yield ethyl tetrahydro-α-(1-naphthylmethyl)-2-furanpropionate; and (c) transesterification of the product of (b) with 2-(diethylamino)ethanol followed by treatment with oxalic acid.

3,661,935

ANTIFUNGAL BENZOPYRAN-5-ONE DERIVATIVE

David Cecil Aldridge, Douglas Broadment, Harold George Hemming, and William Brian Turner, Macclesfield, and Keith Joseph Bent, Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 16, 1969, Ser. No. 867,083
Claims priority, application Great Britain, Oct. 29, 1968, 51,273/68
Int. Cl. C07d *7/18*
U.S. Cl. 260—343.2 R 1 Claim

The compound 2,3,3a,9b - tetrahydro - 6 - hydroxy-7,8 - dimethoxy - 2 - n - propyl - 5H - furo[3,2 - c]-benzopyran-5-one, obtained by fermentation of *Helminthosporium monoceras* exhibits anti-fungal properties.

3,661,936

N-METHYL - N - FURFURYL-OLEAMIDE AND N-METHYL - N - TETRAHYDROFURFURYL-OLEAMIDE

Robert R. Mod, Frank C. Magne, and Evald L. Skau, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Application Oct. 12, 1967, Ser. No. 683,060, which is a division of application Ser. No. 529,652, Feb. 24, 1966, now Patent No. 3,403,126, dated Sept. 24, 1968. Divided and this application Nov. 13, 1969, Ser. No. 876,574
Int. Cl. C07d *5/04, 5/16*
U.S. Cl. 260—347.3 2 Claims

The invention provides N-methyl-N-furfuryl-oleamide and N-methyl-N-tetrahydrofurfuryl-oleamide which are useful as plasticizers for vinyl chloride resins.

3,661,937

1,4-DIHYDROXYPOLYHALOPOLYHYDRO - 5,8-METHANO - 2,3 - NAPHTHALENEDICARBOXYLIC ACIDS AND CORRESPONDING ANHYDRIDES

Robert A. Dombro, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 408,673, Nov. 3, 1964. This application Oct. 30, 1968, Ser. No. 772,045

Int. Cl. C07d *5/32*; C07c *61/28*

U.S. Cl. 260—346.3 6 Claims

Novel compositions of matter comprising halo-substituted 1,4-dihydroxypolyhalomethanonaphthalenedicarboxylic acids or anhydrides thereof, as exemplified by 1,4-dihydroxy-5,6,7,8,9,9-hexachloro - 1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalenedicarboxylic acid or anhydride are useful as additives for plastics, polymers, resins, etc. whereby flameproof or fire-retardant properties are added thereto.

In addition, these compositions of matter also form an element of other compositions of matter which are prepared by admixing the acids or anhydrides with a compound containing at least one reactive functional group.

3,661,938

PROCESS FOR THE PREPARATION OF GLYCIDYL ESTERS

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,280

Int. Cl. C07d *1/18*

U.S. Cl. 260—348 A 14 Claims

A glycidyl ester, such as glycidyl methacrylate, is prepared by contacting an unsaturated fatty acid, such as methacrylic acid, with an alkali metal base, such as NaOH, a solution of an alkali metal hydroxide in a first reaction zone to form an alkali metal salt, such as sodium methacrylate, in the presence of a solvent which will azeotrope with water and which is free of epoxide groups. Substantially all of the water is removed from the first reaction zone by, for example, removing a water-solvent azeotrope. The alkali metal salt is then physically separated from the remaining solvent by filtration or centrifugation. The alkali metal salt is then reacted in a second reaction zone with dry epichlorohydrin under substantially anhydrous conditions to form the desired glycidyl ester.

3,661,939

PROCESS FOR THE PRODUCTION OF VITAMIN D_3

Masashi Toyoda, Kawagoe-shi, and Yoshiyuki Tawara, Fukuoka-machi, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,204

Claims priority, application Japan, Dec. 16, 1969, 44/100,628

Int. Cl. C07c *171/10*

U.S. Cl. 260—397.2 6 Claims

A process for producing vitamin D_3 or its acylate characterized by irradiating a solution of a 7-dehydrocholesterol acylate with ultraviolet rays so as to be photoisomerized to produce a previtamin D_3 acylate.

3,661,940

DERIVATIVES OF 21-METHYL-19-NORPREGNANES

Robert V. Coombs, Summit, and Eugene E. Galantay, Morristown, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,554

Int. Cl. C07c *169/34*

U.S. Cl. 260—397.3 16 Claims

The compounds are 21-methyl-19-norpregnane derivatives bearing a double bond in the 17(20)-position and a keto-group in the 21-position, e.g., 21-methyl-19-nor-4, 17(20)-pregnadiene-3,21-dione. Said compounds are useful as pharmaceutical agents, and may be obtained by treatment of a 17-alpha-propadienyl, 17-beta-hydroxy-substituted steroidal compound, e.g. with a protonating agent.

3,661,941

PROCESS FOR PREPARATION OF 3β-HYDROXY A/B CIS STEROIDS OF THE CHOLESTANE SERIES

Jerry R. Dias, 865 Carlisle Way, Sunnyvale, Calif. 94087, and George R. Pettit, 6232 Bret Hills Drive, Paradise Valley, Ariz. 85253

No Drawing. Filed Oct. 9, 1970, Ser. No. 79,667

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.3 6 Claims

There is provided a novel procedure for converting a 3β-hydroxy-17-oxo-androst-5-ene into a 3β-hydroxy A/B cis-steroid of the cholestane series, thus providing a new and useful route for the preparation, inter alia of bufalin and resibufogenin from readily available materials.

3,661,942

NOVEL CHEMICAL PROCESS

Verlan H. Van Rheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 651,130, July 5, 1967. This application Sept. 8, 1969, Ser. No. 856,217

Int. Cl. C07c *167/00*

U.S. Cl. 260—397.3 10 Claims

This invention is the discovery that copper salts catalyze the oxygenation of enamines to product useful products of oxidative cleavage, including oxidative decarbonylation, and/or diketone formation, depending on the structure of the enamine.

3,661,943

17α-BUTATRIENYL STEROIDS

John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,560

Int. Cl. C07c *169/08, 169/20*

U.S. Cl. 260—397.4 6 Claims

17α-butatrienyl-estra - 1,3,5(10) - triene steroids and 17α-butatrienyl-androst-4-ene and 17α-butatrienyl-19-norandrost-4-ene steroids and methods of making these compounds. The compounds are prepared from the corresponding 17α-(2',3'-dihalomethyleneprop-1'-en - 1' - yl) steroid compounds by dehalogenation and rearrangement of the 17α-dihalocyclopropyl group into a propadiene group thereby affording the above butatriene compounds. The above 17α-butatrienyl-estra-1,3,5(10)-triene steroids have utility in palliating conditions arising in mammals which are caused by or related to estrogen deficiency. The 17α-butatrienyl-androst - 4 - ene and 17α-butatrienyl-19-norandrost-4-ene steroids are useful for palliating menstrual disorders and in the control and regulation of fertility in mammals.

3,661,944

4-(N-LOWER ALKANOYL)HYDROXYLAMINO-4'-AMINODIPHENYLSULFONE COMPOUNDS

Frederick G. Dowalo, Maple Shade, N.J., and Bernard Loev, Broomall, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed July 1, 1970, Ser. No. 51,714
Int. Cl. C07c *147/06*
U.S. Cl. 260—397.6 3 Claims

The compounds are 4-(N-lower alkanoyl)hydroxylamino-4'-aminodiphenylsulfones having antimalarial activity. A preferred compound is bis[p-(N,O-diacetyl) hydroxylaminophenyl]sulfone.

3,661,945

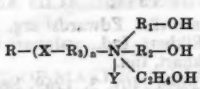
REACTION PRODUCTS OF CERTAIN CATIONIC COMPOUNDS WITH ANIONIC COMPOUNDS, COMPOSITIONS CONTAINING SAME AND METHODS FOR PREPARING SAME

Hans S. Mannheimer, 23 Hains Cove Drive, Toms River, N.J. 08753

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,453
Int. Cl. C07c *143/90*
U.S. Cl. 260—401 14 Claims

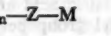
Reaction products of compounds of:

Formula I



and compounds of:

Formula II



3,661,946

PHOSPHATIDE EXTRACTION

Hermann Pardun, Kleve, Germany, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Sept. 17, 1968, Ser. No. 760,350
Claims priority, application Germany, Sept. 19, 1967, P 16 92 568.1
Int. Cl. C07f *9/02*
U.S. Cl. 260—403 8 Claims

In the separation of vegetable phosphatide fractions from mixtures containing them, by extracting the mixture with a lower aliphatic alcohol containing from 1 to 3 carbon atoms, the efficiency of the extraction process, expressed as percentage recovered choline lecithin present in the alcohol-soluble choline lecithin-enriched fraction, is increased to an important degree without adversely affecting the selectivity, expressed as the weight ratio of choline lecithin to cephalin in the same fraction, by carrying out the extraction in the presence of from 5 to 30%, preferably 10 to 20%, by weight of the total amount of phosphatides present in the mixture to be extracted of a monoglyceride which is liquid at the temperature of extraction.

3,661,947

CARBONYL HALIDE CATALYST FOR α-BROMINATION OF ALIPHATIC ACIDS

Robert M. Thomas and Rastko I. Mamuzic, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

No Drawing. Filed Aug. 21, 1969, Ser. No. 852,111
Int. Cl. C07c *51/00*; C07f *7/00*
U.S. Cl. 260—408 8 Claims

Saturated aliphatic acids unsubstituted in the α-position are brominated in the alpha position by reacting the acid with elemental bromine in the presence of a carbonyl halide of the formula

wherein X is bromine or chlorine and R is bromine or chlorine.

3,661,948

CATALYTIC PREPARATION OF CARBOXYLIC ACID ESTERS FROM OLEFINS, ALCOHOLS AND CARBON MONOXIDE IN THE PRESENCE OF AN ALKYL ETHER AND AN ACTIVATOR AMOUNT OF WATER

Raymond A. Schell, Berkley, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 671,110, Sept. 27, 1967. This application Mar. 20, 1970, Ser. No. 21,474
Int. Cl. C07c *67/00, 51/14*
U.S. Cl. 260—410.9 R 33 Claims

A process is described for preparing carboxylic acid esters from olefins, alcohols and carbon monoxide using a combination of tin or germanium salt; a platinum salt as the catalyst, an ether and an activator amount of water.

Olefins having from 8 to about 24 carbon atoms are preferred reactants. Alkyl ethers having up to 16 carbon atoms are useful.

The reaction rate is unexpectedly improved by the combination of alkylether and activator.

3,661,949

HYDROCARBOXYLATION PROCESS UTILIZING AN IRON SALT COCATALYST

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed June 11, 1969, Ser. No. 832,413
Int. Cl. C07c *51/14*
U.S. Cl. 260—413 15 Claims

A process for preparation of carboxylic acids wherein the isomer distribution of the product is controlled by use of varied cocatalysts which comprises contacting an ethylenically unsaturated hydrocarbon, carbon monoxide and water under liquid phase conditions with a Group VIII noble metal catalyst in the presence of an iron cocatalyst such as an iron pentacarbonyl, di iron nonacarbonyl or iron chloride cocatalyst. The iron carbonyl cocatalysts have been found to increase the ratio of straight-chain acid to branched-chain acid and the iron chloride cocatalyst has been found to increase the ratio of branched-chain acid to straight-chain acid.

3,661,950

PROCESS FOR PRODUCING ALKANOIC ACIDS FROM NITROKETONES

John M. Larkin, Wappingers Falls, and Harry Chafetz, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 18, 1970, Ser. No. 90,791
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 10 Claims

A process for preparing alkanoic acids from vicinal nitroalkanones which comprises contacting a vicinal nitroalkanone under non-aqueous conditions with a catalyst comprising a sulfonic acid cation exchange resin at temperatures of at least 100° C.

3,661,951

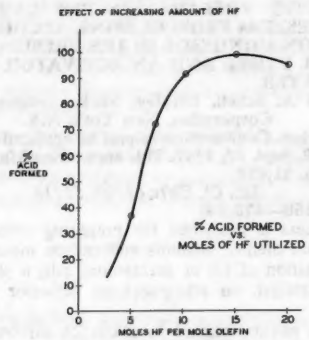
CARBOXYLATION OF OLEFINS

Eugene J. Miller, Jr., Wheaton, and Ago Maris, La Grange Park, Ill., assignors to Armour Industrial Chemical Company

Continuation of application Ser. No. 747,613, July 15, 1968, which is a continuation of application Ser. No. 450,836, Apr. 26, 1965. This application Dec. 1, 1969, Ser. No. 876,203

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 2 Claims



Method of carboxylating olefins with CO utilizing at least 10 moles of HF per mole of olefin plus water slightly in excess of the stoichiometric amount of olefin to obtain high yields of high quality acid.

3,661,952

ORGANOLEAD MANUFACTURE

Wilford H. Thomas, Paul Kobetz, and Albert P. Giraitis, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed July 29, 1970, Ser. No. 59,359

Int. Cl. C07f *7/24*

U.S. Cl. 260—437 R 23 Claims

The process for the production of tetraalkyllead compounds from sodium-lead alloy and an alkyl halide is improved by the utilization of a hydrocarbyl-aluminum catalyst and a promoter or adjuvant selected from the group consisting of an alkali metal fluoride, an alkaline earth metal fluoride, an alkaline metal cyanide, an alkaline earth metal cyanide, an alkali metal alkoxide, an alkaline earth metal alkoxide and any mixture thereof. The hydrocarbyl-aluminum catalyst may be either a lower or alkyl aluminum halide or a lower alkyl aluminum alkoxide.

3,661,953

SYNERGISTIC METAL SEQUESTRANT

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 680,011, Nov. 2, 1967. This application July 13, 1970, Ser. No. 54,665

Int. Cl. C07f *15/02*

U.S. Cl. 260—439 R 20 Claims

Mixtures of tris(hydroxymethyl)phosphine oxide and an alkali metal tripolyphosphate exhibit marked synergism as sequestrant compositions over a broad pH range. The sequestrant compositions are useful as additives for detergents, metal cleaning baths, peroxide compositions and dyes. The chelate products are useful in the field of agriculture for the introduction of trace elements into plant life and especially in the treatment of iron chlorosis in plants.

3,661,954

SILYLALKYL PHENYLTHIOLATES

Gary E. LeGrow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 13, 1970, Ser. No. 54,666

Int. Cl. C07f *7/10, 4/18*

U.S. Cl. 260—448.2 N 4 Claims

Thiolbenzoic acid is added to alkenylsilanes or siloxanes to give compounds of the formula

$$C_6H_5C{=}OSR'_nSiX_mO_{\frac{4-n-m}{2}}$$

For example, thiolbenzoic acid is added to vinyldimethylchlorosilane under the influence of ultraviolet light to give $C_6H_5C{=}OS(CH_2)_2Si(CH_3)_2Cl$. The thiolates are useful as intermediates in the preparation of mercaptoalkylsilanes and siloxanes.

3,661,955

POLYESTERS OF CITRIC ACID AND SORBITOL

Albert Peter Centolella, Edwardsburg, Mich., and Billy Gene Razor, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,711

Int. Cl. C07c *69/66*

U.S. Cl. 260—404 B 5 Claims

Polyesters of citric acid and sorbitol having less than one free carboxyl group per mole of citric acid in the polyester and physiologically acceptable salts thereof are disclosed, the poiyesters having a molar ratio of citric acid to sorbitol between 1:2 and 2:3. These polyesters are useful as additives in yeast raised products.

3,661,956

POLYMERISED FATTY ACIDS AND THEIR ESTERS

Gerald Alfred Silverstone, Sale, England, assignor to Victor Wolf Limited, Manchester, England

No Drawing. Continuation-in-part of application Ser. No. 544,815, Apr. 25, 1966. This application May 1, 1969, Ser. No. 821,127

Int. Cl. C09f *7/06*

U.S. Cl. 260—407 4 Claims

Alkyl esters of dimeric and polymeric fatty acids are produced by heating an alkyl ester of a hydroxy acid in a liquid hydrocarbon solvent which forms an azeotrope with water and in the presence of a dehydration catalyst selected from acid and alkaline clays, inorganic oxides, ion exchange resins and acid sulphates, thereby simultaneously dehydrating and polymerising the ester.

3,661,957

PREPARATION OF CARBOXYLIC ACIDS

Ronald L. Shubkin, Oak Park, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Dec. 8, 1969, Ser. No. 883,309

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 13 Claims

A process for preparing carboxylic acids from C_{10+} olefins, CO and H_2O using a cobalt catalyst and a ketone or ether solvent; and the use of pyridine as a promoter in this process, are disclosed.

3,661,958

PROCESS FOR THE MANUFACTURE OF DIALKYLTIN DIIODIDE FROM TIN AND ALKYL IODIDE

Mitsuo Onozuka and Kinji Iida, Fukushima-ken, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 10, 1969, Ser. No. 831,878

Claims priority, application Japan, June 25, 1968, 43/43,740; Aug. 21, 1968, 43/59,206; Sept. 19, 1968, 43/67,232, 43/67,233; Sept. 24, 1968, 43/68,289; Sept. 27, 1968, 43/69,524; Oct. 2, 1968, 43/71,172; Oct. 8, 1968, 43/72,830; Oct. 15, 1968, 43/74,661, 43/74,662, 43/74,663; Oct. 18, 1968, 43/75,601

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 13 Claims

A process for the manufacture of dialkyltin diiodides which comprises reacting metallic tin and an alkyl iodide having from 8 to 24 carbon atoms in the alkyl moiety, said alkyl iodide being present in a ratio of from 2.2 to 4.0 mols of alkyl iodide to 1.0 gr.-atom of said metallic tin, and further, said reaction being carried out in the presence of from 0.001–0.5 mols of a catalyst consisting essentially of a nitrogen-containing organic catalytic compound selected from the group consisting of a primary, secondary, and tertiary amine, a heterocyclic amine, and a lactam.

3,661,959

METHOD OF MAKING ORGANOGOLD CHLORIDE COMPLEXES

Lawrence G. Vaughan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 30, 1970, Ser. No. 59,712

Int. Cl. C07f 1/12

U.S. Cl. 260—430 27 Claims

There is provided a method of making organogold(I) chloride complexes, L→AuCl, by reacting an organo ligand selected from the group consisting of organo isocyanides, arsines, phosphines, stibines and phosphites with a sulfide gold(I) monochloride complex, R_1R_2SAuCl, where R_1 and R_2 are aliphatic groups containing from 1 to 12 carbon atoms or combine to form a cycloaliphatic group. Also provided are certain new chloro(dialkylphenylisocyanide)gold(I), chloro(diarsine)gold(I)chloro(triarylstibine)gold(I) complexes.

3,661,960

SYNERGISTIC METAL SEQUESTRANT

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 680,011, Nov. 2, 1967. This application July 13, 1970, Ser. No. 54,664

Int. Cl. C07f 15/02

U.S. Cl. 260—439 R 10 Claims

Mixtures of tris(hydroxymethyl)phosphine oxide, and tris(N,N-diacetoaminomethyl)phosphine as well as the alkali metal salts thereof, exhibit marked synergism as sequestrant compositions over a broad pH range. The sequestrant compositions are useful as additives for detergents, metal cleaning baths, peroxide compositions and dyes. The chelate products are useful in the field of agriculture for the introduction of trace elements into plant life and especially in the treatment of iron chlorosis in plants.

3,661,961

REACTION PRODUCTS OF SILICON MONOXIDE AND ALIPHATIC HYDROCARBONS AND METHOD OF MAKING THE SAME

Erich T. Schaschel, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,228

Int. Cl. C07f 7/08, 7/18

U.S. Cl. 260—448.2 H 15 Claims

An organo silicon polymer is prepared by the reaction of silicon monoxide and the C—H bond of an aliphatic hydrocarbon to provide a polymer that is useful as a lubricant, as an ingredient for a coating composition, as a stop-cock grease, and as a filler for ceramic and plastic compositions.

3,661,962

MOLECULAR WEIGHT CONTROL AND POLYSILOXANES

Lothar Ernst Geipel, Adrian, Mich., assignor to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

No Drawing. Filed May 9, 1969, Ser. No. 823,486

Int. Cl. C07f 7/08

U.S. Cl. 260—448.2 E 9 Claims

Hexamethyldisiloxane is used to control the molecular weight in the polymerization of cyclic siloxanes with a basic catalyst. The addition of a promoter, such as dimethylformamide, permits efficient utilization of the hexamethyldisiloxane and thereby permits accurate control over the molecular weight of the polysiloxane.

3,661,963

QUATERNARY AMMONIUM SALTS OF CHLOROMETHYLATED SILICON COMPOUNDS

Enrico J. Pepe, Amawalk, and Bernard Kanner, West Nyack, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 423,414, Dec. 31, 1964. This application Mar. 3, 1969, Ser. No. 803,973

Int. Cl. C07f 7/10, 7/18

U.S. Cl. 260—448.2 N 18 Claims

Quaternary ammonium salts of chloromethylated silanes or siloxanes which contain at least one

$$[Cl^-R_3''N^+CH_2—Ar—(R\rightarrow)_n]$$

radical directly linked to a silicon atom wherein Ar is an arylene radical, wherein R''_3N taken collectively is a tertiary amine radical and wherein the compounds are useful in conventional silicon applications such as antistatic agents, wetting agents, lubricants, hydraulic fluids, coating resins, elastomers and cationic surfactants.

3,661,964

METHOD FOR PREPARING AMINOALKYL-ALKOXY SILOXANES

Brian J. Griffiths, Herbert T. Cooper, and Peter F. Hudson, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, Berkshire, England

No Drawing. Filed July 17, 1970, Ser. No. 55,975

Int. Cl. C07f 7/08, 7/18

U.S. Cl. 260—448.8 R 3 Claims

Siloxane polymers containing both aminoalkyl and alkoxy substituents are defined by the general formula

$$R_3SiO(CH_3R'SiO)_x(CH_3R''SiO)_y(R'''_2SiO)_zSiR_3$$

where R and R''' are hydrocarbyl radicals, R' is an alkoxy or alkoxyalkoxy of less than 6 carbon atoms, R'' is $—XNY_2$ where X is alkylene of 3–20 carbon atoms, the nitrogen being at least 3 carbons removed from Si, Y is

hydrogen hydrocarbyl or trihydrocarbylsilyl, x is 5 to 95, y is 1 to 50, z is up to 10% of $x+y$, $x+y+z$ is 20 to 100. These siloxanes are useful as release agents and water repellents on paper and other substrates.

3,661,965
PROCESS FOR THE PRODUCTION OF ISONITRILES

Dieter Arlt, Cologne-Buchheim, and Hermann Hagemann, Cologne-Flittard, Germany, and Peter Hoffmann, Hollywood, and Ivar Ugi, Santa Monica, Calif., assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,101
Claims priority, application Germany, Feb. 24, 1968, P 16 68 100.8
Int. Cl. C07c *121/00, 121/12*
U.S. Cl. 260—464 **6 Claims**

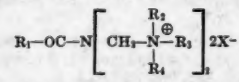
Process for producing isonitriles wherein an N-monosubstituted formamide is reacted with an acylating agent at a pH-value of between 4 and 14 in the presence of a hydrophobic solvent and of a base.

3,661,966
BISAMMONIUM COMPOUNDS AND PROCESS FOR PREPARING THEM

Wilhelm Bartmann, Frankfurt am Main, Dieter Duwel, Hofheim, Taunus, Volkmar Georgi, Frankfurt am Main, Erhard Wolf, Hofheim, Taunus, Claus Beermann, Neu-Isenburg, and Franz Landauer, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,451
Claims priority, application Germany, Aug. 9, 1968, P 17 93 166.7
Int. Cl. C07c *125/06*
U.S. Cl. 260—482 C **15 Claims**

Bis-ammonium compounds of the formula



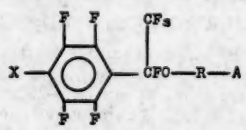
wherein R_1 is alkyl having 1 to 6 C-atoms, alkoxy having 1 to 25 carbon atoms, alkenyloxy having 3 to 18 C-atoms, cycloalkoxy having 4 to 8 C-atoms, cycloalkylalkoxy or alkylcycloalkoxy each having 5 to 8 C-atoms, and halogeno-alkoxy or alkoxyalkoxy each having 1 to 6 C-atoms, R_2 is alkyl having 1 to 3 C-atoms, R_3 is alkyl having 1 to 25 C-atoms, alkenyl having 3 to 18 C-atoms, cycloalkyl having 4 to 8 C-atoms or phenalkyl having 1 to 2 C-atoms in the alkylene radical and optionally one chlorine atom or a nitro group in the phenyl nucleus, R_4 is alkyl having 6 to 25 C-atoms or alkenyl having 5 to 25 C-atoms, and X^- is an anion of a non-toxic acid and a process for preparing them are described. The compounds have valuable enthelmintic properties.

3,661,967
CYANO CONTAINING POLYFLUOROAROMATIC COMPOUNDS

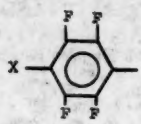
Richard W. Anderson, Midland County, and Hughie R. Frick, Bay County, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 25, 1968, Ser. No. 762,628
Int. Cl. C07c *121/52, 121/54*
U.S. Cl. 260—465 F **2 Claims**

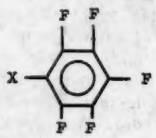
Compounds of the following type are provided:



wherein A is a halogen or



wherein R is a saturated, accyclic, perhalo, organic group consisting essentially of carbon, fluorine and optionally oxygen; and wherein X is an electron withdrawing substituent other than halogen or a group which readily undergoes nucleophilic attack. Also provided is a process for the preparation of these compounds, which comprises the reaction of



wherein X is as defined above, with a vinyl ether, in the presence of an alkali metal fluoride.

3,661,968
ORGANIC REDUCTION PROCESS

William Richard Johns, Reading, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 24, 1969, Ser. No. 844,483
Claims priority, application Great Britain, Aug. 1, 1968, 36,782/68
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 **3 Claims**

In the hydrodimerisation of α,β-olefinically unsaturated compounds, especially of acrylonitrile to adiponitrile, by means of alkali metal or alkaline earth metal amalgam in the presence of a polar solvent, separation of the product hydrodimer is effected by distilling or evaporating from the product mixture sufficient of the polar solvent and unreacted α,β-olefinically unsaturated compound, and, if necessary, adding to the product mixture sufficient water, to cause the product mixture to form two liquid phases, one essentially aqueous and the other essentially organic containing the hydrodimer, and then separating the two phases. A preferred method is to distil with steam.

3,661,969
[2-(ALKYLAMINO)-1-CYCLOHEXEN-YL]-CYANOTHIOANILIDES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 523,867, Feb. 1, 1966. This application Sept. 8, 1969, Ser. No. 858,563
Int. Cl. C07c *121/50, 153/05*
U.S. Cl. 260—465 E **7 Claims**

[2-(alkylamino)-1-cyclohexen-1-yl]thioanilides of the formula

wherein R is alkyl and wherein R' is phenyl, naphthyl, or biphenyl, each having from 1 to 2 cyano substituents. These thioanilides have utility as fungicides.

3,661,970

METHOD FOR REACTING A MIXTURE OF CARBOXYLIC ACIDS WITH AMMONIA TO PROVIDE NITRILES

David W. Canavan, Littleborough, England, assignor to Kraftco Corporation, New York, N.Y.

Filed May 20, 1969, Ser. No. 826,112
Int. Cl. C07c *121/10*
U.S. Cl. 260—465.2 9 Claims

A method of reacting a mixture of carboxylic acids which have varying boiling points with ammonia to provide nitriles. In the method, the mixture of carboxylic acids is reacted with ammonia in a liquid phase at a temperature above the boiling point of some of the carboxylic acids. The vapors from the liquid phase reaction are fractionated into a vapor containing ammonia and lower boiling carboxylic acids and a liquid containing higher boiling carboxylic acids and nitriles. The liquid from the fractionating step is returned to the liquid phase reaction as reflux. The vapor from the fractionating step is mixed with gaseous ammonia and is further reacted to provide nitriles.

3,661,971

N-CHLORO DERIVATIVES OF DIIMINOSUCCINONITRILE

Donald Ray Hartter, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,496
Int. Cl. C07c *121/20, 121/40*
U.S. Cl. 260—465.5 7 Claims

N,N'-dichlorodiiminosuccinonitrile and N-chloro-diiminosuccinonitrile can be made by the action of chlorine on diiminosuccinonitrile or by the action of chlorine on diaminomaleonitrile. The chlorinated diiminosuccinonitriles are useful as herbicides, and provide control for lawn weeds such as crabgrass. Johnson grass and beggarticks were similarly controlled.

3,661,972

PURIFICATION OF HIGH BOILING ESTERS

Paul Biarnais, Melle, France, assignor to Melle-Bezons, Melle, Deux-Sevres, France

Filed Feb. 14, 1969, Ser. No. 799,298
Claims priority, application France, Feb. 26, 1968, 478
Int. Cl. C07c *69/06, 69/80*
U.S. Cl. 260—468 R 17 Claims

A process for purification of high boiling esters produced by the esterification of an alcohol with a carboxylic acid or anhydride in the presence of sulfuric acid wherein the raw esterification product is subject to reaction with water for hydrolyzation of the alkyl hydrogen sulfate produced by the reaction of sulfuric acid with alcohol whereby the products of the hydrolyzation are easily separated from the reaction product.

3,661,973

PROCESS FOR THE PREPARATION OF ADIPONITRILE FROM ADIPIC ACID AND AMMONIA

Yuichi Suzukawa, Hisashi Kono, Kenji Terai, Atushi Kuribayashi, and Takazumi Niwa, Yamaguchi-ken, Japan, assignors to Ube Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan

Filed Feb. 28, 1966, Ser. No. 803,270
Claims priority, application Japan, Mar. 5, 1968, 43/13,796
Int. Cl. C07c *121/10*
U.S. Cl. 260—465.2 3 Claims

Process for preparing adiponitrile comprising reacting adipic acid and ammonia at 250 to 550° C. in a fluidized bed of a solid dehydration catalyst fluidized by ammonia gas, wherein a part of ammonia gas preheated at high temperatures is introduced into the fluidized bed through a funnel-shaped distributor positioned at the bottom of the fluidized bed; adipic acid in form of a hot aqueous solution is sprayed into the fluidized bed through a nozzle for spraying a hot aqueous solution of adipic acid provided at the central portion of said distributor; and the rest of ammonia gas preheated at high temperatures is injected into the fluidized bed as gas jet stream from an injection opening provided at the central portion of said distributor and around said nozzle.

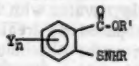
3,661,974

2-CARBALKOXY-PHENYL SULFENAMIDES

John C. Grivas, South Holland, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Filed Apr. 27, 1970, Ser. No. 32,369
Int. Cl. C07c *145/00*
U.S. Cl. 260—470 10 Claims

The compounds disclosed herein are benzene sulfenamides and derivatives thereof having the formula



wherein R is hydrogen, hydrocarbon or substituted hydrocarbon as defined hereinafter, R' is hydrocarbon or substituted hydrocarbon as defined hereinafter, Y is an inert group, and *n* is an integer of 0 to 2 value. The process used for preparing these compounds involves the steps of halogenating an ester of 2-mercaptobenzoic acid or a derivative thereof and reacting the resultant halogenated intermediate with ammonia or a primary amine containing the desired R radical therein. These compounds are useful as intermediates in the preparation of cyclized derivatives useful for pharmaceutical purposes.

3,661,975

N-ACETYL-N-(2,4,6-TRIIODO-3-AMINOPHENYL)-β-AMINO-ISOBUTYRIC ACID

Johannes A. Korver, 7 Albertine Agneslaan, Naarden, Netherlands

No Drawing. Continuation-in-part of application Ser. No. 594,193, Nov. 14, 1966. This application July 31, 1967, Ser. No. 657,036
Claims priority, application Netherlands, Nov. 25, 1965, 6515305; May 26, 1966, 6607275
Int. Cl. C07c *103/32*
U.S. Cl. 260—471 A 8 Claims

N-acetyl-N-(2,4,6-triiodo-3-aminophenyl) - β - aminoisobutyric acid and its physiologically tolerated salts and esters are radiopaque and non-toxic in amounts adequate for cholecystography. They are prepared by reacting metanitraniline with methacrylic acid in a pyridine medium, acetylating the N-3-nitrophenyl-β-amino-isobutyric acid formed, and hydrogenating and iodating the N-acetyl derivative.

3,661,976

4,4'-(2-CYCLOALKYL-ALKYLIDENE)DIPHENOLS AND ETHERS AND ESTERS THEREOF

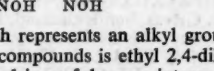
Eugene L. Wittle, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed May 16, 1969, Ser. No. 825,432
Int. Cl. C07d *7/04;* C07c *69/16, 39/12*
U.S. Cl. 260—479 R 4 Claims

A series of 4,4'-(2-cycloalkylalkylidene)diphenols; lower alkyl and tetrahydropyranyl ethers; and esters with carboxylic and sulfonic acids. The compounds have pharmacological activities, especially as anti-fertility agents. They can be produced by (a) reacting a substituted phenyl-magnesium bromide with a carboxylate ester and hydrolyzing and dehydrating the product, (b) hydrolyzing an ether, (c) esterifying a diphenol, (d) hydrolyzing an ester, or (e) converting a diphenol to an ether.

3,661,977
NOVEL DIOXIMES AND PROCESSES FOR PREPARING THE SAME
Tsutomu Uchimoto, Kobe-shi, Hyogo, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan
No Drawing. Filed Apr. 3, 1969, Ser. No. 813,293
Claims priority, application Japan, Apr. 25, 1968, 43/27,918
Int. Cl. C07c *131/00*
U.S. Cl. 260—482 R **9 Claims**

Novel dioximes of the following formula:



wherein R and R′ each represents an alkyl group.

Exemplary of such compounds is ethyl 2,4-dihydroxyliminoacetylpyruvate and is useful as an intermediate for sulfa drugs or inhibitors for monoamine oxidation enzyme.

Alkyl 2,4-dihydroxyliminoacylpyruvates are prepared by treating alkyl acylpyruvates with hydroxylamine. The products are also prepared by treating one of alkyl 4-hydroxyliminoacylpyruvates obtainable by the previous treatment of the alkylacylpyruvates with hydroxylamine, with hydroxylamine.

3,661,978
PROCESS FOR ESTERIFICATION OF TERTIARY TERPENIC ALCOHOLS
Peter S. Gradeff, Somerset, and Bernard Finet, Princeton, N.J., assignors to Rhodia Inc., New York, N.Y.
No Drawing. Filed May 26, 1969, Ser. No. 827,940
Int. Cl. C07c *67/00*
U.S. Cl. 260—486 R **17 Claims**

Tertiary terpenic alcohols, and tertiary vinyl alcohols, such as linalool and homologues thereof, are esterified using the corresponding aliphatic acid anhydride as an acylating agent, and without the necessity of a catalyst or solvent. Linalool can be converted to linalyl acetate using acetic anhydride to give yields in excess of 95% theory.

3,661,979
PROCESS FOR PREPARING METHYL HEXADIENOATES
Mario Dubini, Novara, and Franco Montino, Casale Monferrato, Alessandria, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy
No Drawing. Filed Apr. 1, 1969, Ser. No. 816,152
Claims priority, application Italy, Apr. 3, 1968, 14,760/68
Int. Cl. C07c *69/52*
U.S. Cl. 260—486 AC **5 Claims**

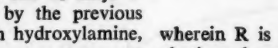
A process for preparing methyl 2,5-hexadienoate starting from allyl chloride, acetylene, carbon oxide and methanol. The process is characterized in that a catalyst is prepared from carbonyl nickel, thiourea and allyl chloride in methanol. The catalyst is then made to react with allyl chloride, acetylene and carbon oxide at a pH value between 4 and 6.

3,661,980
CARBOXYLIC ESTERS OF 3-FORMYLBUTEN-(3)-OL-(1) AND THEIR PRODUCTION
Walter Himmele, Walldorf, Werner Quila, Ludwigshafen, and Richard Prinz, Waiblingen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Apr. 7, 1970, Ser. No. 26,440
Claims priority, application Germany, Apr. 12, 1969, P 19 18 695.9
Int. Cl. C07c *67/00, 69/14, 69/24*
U.S. Cl. 260—488 H **6 Claims**

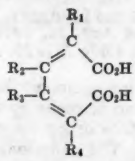
Production of carboxylic esters of 3-formylbuten-(3)-ol-(1) by reacting bismonocarboxylic esters of buten-(2)-diol-(1,4 with carbon monoxide and hydrogen in the presence of carbonyl complexes of rhodium at temperatures of 50° to 110° C. and pressures of 300 to 1000 atmospheres. The products are perfumes and intermediates for the manufacture of vitamin A.

3,661,981
CORROSION INHIBITORS
Samuel E. Jolly, Ridley Park, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Original application July 18, 1966, Ser. No. 565,701, now Patent No. 3,523,894, dated Aug. 11, 1970. Divided and this application Mar. 2, 1970, Ser. No. 15,926
Int. Cl. C07c *87/04*
U.S. Cl. 260—501.2 **5 Claims**

This specification discloses compositions and methods for inhibiting corrosion normally caused by oil well fluids. The compositions comprise a major amount of an amine salt wherein the amine is



wherein R is selected from the group consisting of aliphatic and cycloaliphatic hydrocarbon radicals having 12 to 30 carbon atoms and the acid is



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of CH_3 and H.

3,661,982
DICARBOXYLIC ACID SALTS OF TRANS, TRANS 4,4′-DIAMINODICYCLOHEXYLMETHANE
Geoffrey Ernest Beswick, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed May 17, 1968, Ser. No. 729,908
Claims priority, application Great Britain, May 24, 1967, 24,185/67; Mar. 18, 1968, 13,012/68
Int. Cl. C07c *87/14*
U.S. Cl. 260—501.2 **5 Claims**

Process for the separation of trans-trans rich salts of 4,4′-diaminodicyclohexylmethane and dicarboxylic acid by their preferential insolubility in methanol or benzyl alcohol over similar salts of the other geometrical isomers of 4,4′ - diaminodicyclohexylmethane. Regeneration of trans-trans enriched 4,4′ - diaminodicyclohexylmethane therefrom. The salts especially the dodecanedioic acid salt may be used for the manufacture of polyamides. Other solvents may be used in conjunction with methanol or benzyl alcohol.

3,661,983
DITHIOCARBONYLHYDRAZIDIC ACID AND DERIVATIVES AND THE METHOD OF MAKING SAME
Lawrence H. Nash, P.O. Box 596, Belle Glade, Fla. 33430
No Drawing. Filed Nov. 26, 1968, Ser. No. 779,252
Int. Cl. C07c *155/04, 155/06, 155/10*
U.S. Cl. 260—513.5 **9 Claims**

The compounds are the reaction of and derivatives of hydrazine and carbon bisulphide, reacted on a molecular basis. A representative compound of the invention being,

the "sodium N,N-dichloro-N-dithiocarbonylhydrazide." The compounds can be employed as insecticides, fungicides, bactericides, microbicides, etc. for the control of pathogens on humans, animals and plants.

3,661,984
OXIDATION OF AROMATIC COMPOUNDS
Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 598,619, Dec. 2, 1966. This application Feb. 17, 1969, Ser. No. 799,949
The portion of the term of the patent subsequent to Feb. 18, 1986, has been disclaimed
Int. Cl. B01j *9/04;* C07c *63/02*
U.S. Cl. 260—524 R 9 Claims

Aromatic compounds, and particularly aromatic hydrocarbons, are treated with an excess of an oxygen-containing gas in the presence of a chain-transfer agent and water at elevated temperatures to prepare oxidized products thereof. This is exemplified by the conversion of p-xylene to terephthalic acid.

3,661,985
PROCESS FOR THE PRODUCTION OF NON-CAKING UREA
Jean Cluzel and Paul Souviron, Toulouse, France, assignors to Azote et Produits Chimiques S.A., Toulouse, France
No Drawing. Filed Jan. 2, 1969, Ser. No. 788,643
Claims priority, application France, Jan. 2, 1968, 134,582
Int. Cl. C07c *127/00*
U.S. Cl. 260—555 C 3 Claims

Urea with a small content of biuret and which does not cake on storage is produced by coating granulated urea having 0.9 to 1.2% by weight of water, obtained by starting from a concentrated solution at a temperature below 130°, with a film of hexamethylene tetramine formed in situ by reaction at 0 to 50° C. between a 32 to 42% by weight solution of formol (aqueous formaldehyde), having a pH of 3 to 6, atomized onto the granules, and excess ammonia content in said granules as they leave the granulation stage.

3,661,986
PREPARATION OF ALPHA-CHLOROALIPHATIC ACIDS
Paul H. Washecheck, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Feb. 5, 1969, Ser. No. 796,908
Int. Cl. C07c *51/26*
U.S. Cl. 260—530 R 3 Claims

Alpha-haloaliphatic acids can be prepared directly by halo-oxidation of enolizable aldehydes in a one-step process by contacting the aldehyde with a halide in an aqueous medium and the absence of light. Alternatively the alpha-haloaliphatic acid can be prepared from alpha-haloaldehyde by the same process.

3,661,987
PRODUCTION OF MUCOBROMIC ACID
Helmut Schlecht, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Nov. 4, 1969, Ser. No. 874,062
Claims priority, application Germany, Nov. 20, 1968, P 18 09 947.3
Int. Cl. C07c *51/32*
U.S. Cl. 260—530 R 8 Claims

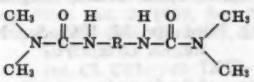
Production of mucobromic acid by reaction of furfurol with bromine in the presence of nitric or nitrous acid. The product is a starting material for the production of dyes and plant protection agents.

3,661,988
PROCESS FOR THE PREPARATION OF ACETIC ACID
Jacques Boichard, Bernard Brossard, Michel Gay, and Raymond Janin, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France
Filed June 24, 1968, Ser. No. 739,456
Claims priority, application France, June 28, 1967, 112,277; Sept. 14, 1967, 121,024
Int. Cl. C07c *53/08*
U.S. Cl. 260—533 R 5 Claims

Acetic acid is prepared by oxidising propylene with nitric acid in the presence of a vanadium catalyst.

3,661,989
PROCESS FOR PREPARING CERTAIN SUBSTITUTED BIS-UREAS
Aleksandra Chrobok Nawakowski, 27 Faucett St., Glenbrook, Conn. 06906
No Drawing. Filed May 31, 1967, Ser. No. 642,329
Int. Cl. C07c *127/18*
U.S. Cl. 260—553 A 8 Claims

A process for preparing a compound having the formula:



comprising reacting two moles of dimethyl amine with one mole of a diisocyanate having the formula:

$$O{=}C{=}N{-}R{-}N{=}C{=}O$$

wherein R in both structural formulae is a divalent aromatic radical selected from the group consisting of unsubstituted phenylene, methyl substituted phenylene, dimethyl diphenylene and methylene diphenylene wherein said reaction is carried out in an aqueous medium at a temperature between about 10° C. and 30° C. and wherein the initial concentration of dimethyl amine in solution is between about 10% and 30%, by weight, based on the weight of the solution.

3,661,990
N-ALKYLSULFONYL BENZOYLHALOALKYL-SULFONANILIDES
Joseph Kenneth Harrington, Edina, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.
No Drawing. Filed Apr. 13, 1970, Ser. No. 28,123
Int. Cl. C07c *143/74*
U.S. Cl. 260—556 F 11 Claims

N-alkylsulfonyl benzoylhaloalkylsulfonalides in which the aromatic rings are optionally substituted. These compounds are active anti-inflammatory agents.

3,661,991
N-(1,1-DIALKYL-3-CHLOROACETONYL) BENZAMIDES
Patrick J. McNulty, Wyndmoor, Colin Swithenbank, Perkasie, Kenneth L. Viste, Warminster, and William C. von Meyer, Willow Grove, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Filed May 29, 1969, Ser. No. 829,084
Int. Cl. C07c *103/42*
U.S. Cl. 260—558 D 7 Claims

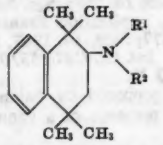
Novel compounds belonging to the class of N-(1,1-dialkyl-3-mono(di and tri)-chloroacetonyl)-3-(or -3,4-, -3,5- or -3,4,5-) substituted benzamides. These compounds are selective herbicides and fungicides.

3,661,992
1,2,3,4-TETRAHYDRO-1,1,4,4-TETRAMETHYL-2-NAPHTHYLAMINES

Royal E. Bright, Penfield Downs, Richard W. Rees, Newtown Square, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 29, 1970, Ser. No. 51,000
Int. Cl. C07c *87/28, 87/66, 129/08*
U.S. Cl. 260—570.8 R 7 Claims

Compounds of the formula



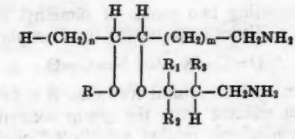
wherein R^1 is hydrogen or methyl; and R^2 is lower alkyl, lower alkenyl, phenyl (lower) alkyl, N-amidinoamidino, or 2-guanidino ethyl are prepared from 1,2,3,4-tetrahydro-1,1,4,4-tetramethyl-2-aminonaphthyl amine. The final compounds exert mydriatic activity.

3,661,993
ETHER DIAMINES

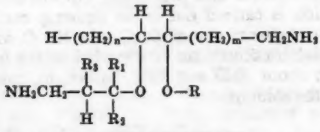
Robert C. Kuder, Excelsior, Minn., and Marwan R. Kamal, Dhahran, Saudi Arabia, assignors to General Mills, Inc.

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,495
Int. Cl. C07c *93/02*
U.S. Cl. 260—570.7 13 Claims

Ether diamines of the formulae



and

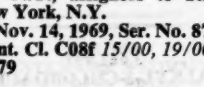


where n is 4 to 19, m is 0 to 15, the sum of n and m is 13 to 19, R_1, R_2 and R_3 are hydrogen or short chain alkyl groups of 1 to 4 carbon atoms and R is a monovalent organic radical. Diisocyanates derived therefrom with the same being useful for preparing polymers.

3,661,994
GRAFT POLYMERS OF RUBBER FOR REINFORCING PLASTICS

Jesse C. H. Hwa, Stamford, Conn., and Ruth E. Gallagher, Dobbs Ferry, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,928
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—879 2 Claims



Controlled emulsion polymerization provides multilayered particles comprising a hard polymeric core, a coating of rubber and, if desired, one or more hard outer polymeric coating. These rubber-containing "sandwich" polymer particles are useful particularly as high impact plastics and modifiers to reinforce relatively rigid types of plastics.

3,661,995
PROCESS FOR THE MANUFACTURE OF α,ω-ALIPHATIC DIAMINES

Dhafir Yusuf Waddan and Derek Williams, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Jan. 7, 1969, Ser. No. 789,587
Claims priority, application Great Britain, Jan. 31, 1968, 4,959/68
Int. Cl. C07c *85/12*
U.S. Cl. 260—583 K 8 Claims

Aliphatic α,ω-diamines are produced by the hydrogenation of aliphatic α,ω-dinitriles at pressures of from 1–500 atmospheres and at a temperature of 50–200° C. in the presence of a Ziegler catalyst prepared from Group VIII metal compounds and metal alkyls, metal aryls or hydrides of alkali metals.

3,661,996
PURIFICATION OF N-SUBSTITUTED HYDROXYLAMINES

Henry Bader, Newton Center, and Alexander Boag, Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,820
Int. Cl. C07c *83/00, 83/02, 85/16*
U.S. Cl. 260—584 C 15 Claims

N-substituted hydroxylamines are separated from non-basic impurities in their crude reaction mixtures by contacting the crude mixture with a strongly acidic ion exchange resin and removing the non-basic impurities by elution with an aqueous solution of an organic eluent. The hydroxylamine is then eluted from the resin using aqueous acid, and subsequently isolated from aqueous solution by solvent extraction.

3,661,997
MONO-OXO CAROTENES

Joseph Donald Surmatis and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Feb. 23, 1967, Ser. No. 617,787, now Patent No. 3,558,712, dated Jan. 26, 1971. Divided and this application July 16, 1970, Ser. No. 55,565
Int. Cl. C07c *49/61*
U.S. Cl. 260—586 1 Claim

Method by which zeaxanthins, xanthophylls and 3-oxo-β-carotene can be synthesized from the condensation product of mesityl oxide and aceto-acetic ester as well as new and novel intermediates produced in the synthesis. Zeaxanthin and xanthophyll are known coloring agents for foodstuffs, including beverages, pharmaceutical and cosmetic preparations. Furthermore, through the use of the condensation product of mesityl oxide and aceto-acetic acid, new compounds for coloring foodstuffs, including beverages, pharmaceutical and cosmetic preparations are produced.

3,661,998
BICYCLIC KETONES HAVING BIOLOGICAL ACTIVITY

Paul E. Hoch, Moraga, Calif., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 413,952, Nov. 25, 1964. This application Mar. 18, 1968, Ser. No. 714,058
Int. Cl. C07c *45/00, 49/00, 49/76*
U.S. Cl. 260—586 R 1 Claim

Bicyclic ketones of the formula

wherein R^1, R^2, R^3, R^4, X^1, X^2, X^3, X^4 and X^5 are certain substituents selected from hydrogen, halogen, alkyl, alkenyl, halogenated alkyl, halogenated alkenyl, alkoxy, hydrocarbyl, halogen-substituted hydrocarbyl, carboxy, hydroxy-substituted alkyl, alkoxy-substituted alkyl, and hydroxy-substituted alkoxyalkyl, with at least two of X^1, X^2, X^3 and X^4 being halogen, and X^6 is halogen. The bicyclic ketones are made by treating a corresponding tricyclic hemiketal with phosphorus halide and hydrolyzing. The bicyclic ketones are useful as chemical intermediates and as insecticides.

3,661,999

PHENANTHRENE DERIVATIVES

Wataru Nagata, Nishinomiya-shi, Tadao Terasawa, Takatsuki-shi, and Tsutomu Aoki, Amagasaki-shi, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Dec. 6, 1968, Ser. No. 781,964
Claims priority, application Japan, Dec. 26, 1967, 42/85,159, 42/85,160; Feb. 13, 1968, 43/9,012
Int. Cl. C07c *49/76*
U.S. Cl. 260—590 **9 Claims**

Phenanthrene derivatives useful as medicaments for anti-androgenic therapy and acne-prophylactic or treatment thereof.

3,662,000

METHOD FOR TREATING A REACTION MIXTURE CONTAINING HYDROPEROXIDES

Ken Ito and Hiroshi Kaminaka, Toyonaka-shi, Norio Kotera, Amagasaki-shi, Shinji Yamamoto, Iwao Dohgane, and Kosuke Shigehiro, Nashinomiya-shi, Hiroshi Kuruma, Takarazuka-shi, Takashi Chinuki, Toyonaka-shi, Hiroshi Yoshitake and Kenji Tanimoto, Minoo-shi, Shinichi Hasegawa, Amagasaki-shi, and Nobuki Kobayashi, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Mar. 6, 1969, Ser. No. 805,032
Claims priority, application Japan, Mar. 14, 1968, 43/16,915
Int. Cl. C07c *49/06, 49/08, 49/30*
U.S. Cl. 260—593 **7 Claims**

In a process for obtaining an aromatic hydroxy compound and an aliphatic ketone by contacting an alkyl aromatic hydrocarbon with molecular oxygen containing gas, for example, O_2 gas or air, to obtain a mixture containing an aralkyl hydroperoxide and subjecting the hydroperoxide to an acid catalyzed cleavage, an improvement which comprises treating the mixture containing aralkyl hydroperoxide with an aqueous alkaline solution, for example, NaOH, prior to the acid-catalyzed cleavage step, whereby an acidic corrosive compound existing in the mixture is substantially excluded.

3,662,001

PRODUCTION OF 3-KETOBUTANOL-(1)

Herbert Mueller, Frankenthal, and Hermann Overwien, Harald Koehl, and Horst Pommer, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,454
Claims priority, application Germany, May 7, 1968, P 17 68 377.1
The portion of the term of the patent subsequent to Dec. 1, 1987, has been disclaimed
Int. Cl. C07c *49/18*
U.S. Cl. 260—594 **8 Claims**

Production of 3-ketobutanol by reaction of acetone with aqueous formaldehyde solution at a temperature above 210° up to 300° C. at a superatmospheric pressure. Methyl vinyl ketone (which can be polymerized to high molecular weight compounds) is prepared from 3-ketobutanol by elimination of water in the presence of aluminum oxide.

3,662,002

CATALYTIC PRODUCTION OF DIMETHYL SULFIDE

Helmut Magerlein, Erlenbach, Gerhard Meyer, Obernburg, and Hans-Dieter Rupp, Erlenbach, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,203
Claims priority, application Germany, Aug. 10, 1968, P 17 93 174.7
Int. Cl. C07c *149/10*
U.S. Cl. 260—609 A **9 Claims**

Process for the catalytic production of dimethyl sulfide in which methanol and hydrogen sulfide can be reacted in about equimolar amount to achieve almost quantitative yields of dimethyl sulfide by carrying out the reaction in the presence of a catalyst consisting essentially of aluminum oxide having a superimposed layer of up to about 10% by weight of silica applied thereto.

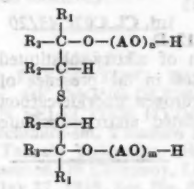
3,662,003

POLYALKYLENEGLYCOL ETHERS OF BIS-(HYDROXYALKYL)-SULFIDES

Wilfried Umbach, Langenfeld, Rhineland, Rainer Mehren, Neuss, Rhineland, Werner Stein, Erkrath-Unterbach, Rhineland, and Ernst Gott, Ratingen-Tiefenbroich, Rhineland, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,352
Claims priority, application Germany, Oct. 9, 1968, P 18 01 951.7
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 R **4 Claims**

Polyalkyleneglycol ethers of bis(hydroxyalkyl)-sulfides having the formula



wherein R_1 is an alkyl having from 1 to 22 carbon atoms, R_2 and R_3 are members selected from the group consisting of hydrogen and alkyl having from 1 to 21 carbon atoms, with the proviso that the sum of the carbon atoms in each set of R_1, R_2 and R_3 is from 4 to 22, A is a bivalent member having from 2 to 4 carbon atoms selected from the group consisting of alkylene, haloalkylene and hydroxyalkylene, *n* and *m* represent integers from 0 to 100 with the proviso that the sum of *n* and *m* is an integer from 1 to 100. The compounds have surface active properties and are useful per se or as intermediates.

3,662,004

PROCESS FOR PRODUCING HYDROXYALKYL MERCAPTANS

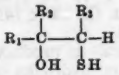
Wilfried Umbach, Langenfeld, Rainer Mehren, Neuss, and Werner Stein, Erkrath-Unterbach, Germany, assignors to Henkel & Cie. GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Continuation-in-part of application Ser. No. 818,390, Apr. 22, 1969. This application Oct. 2, 1969, Ser. No. 863,387
Claims priority, application Germany, Apr. 23, 1968, P 11 68 264.3; Oct. 5, 1968, P 18 01 551.5
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 R **17 Claims**

Processes of reacting hydrogen sulfide with a mono or poly, terminal or non-terminal, aliphatic or cycloaliphatic epoxides having more than 3 carbon atoms in the

presence of 0.01% to 10% by weight of a strongly basic catalyst in the temperature range of from —20° C. to 200° C. at normal to elevated pressures in order to obtain a hydroxyalkyl mercaptan containing more than 3 carbon atoms.

The novel products are higher molecular weight hydroxyalkyl mercaptans of the formula



wherein R_1 is a member selected from the group consisting of alkyl having from 1 to 22 carbon atoms, alkylol having from 1 to 22 carbon atoms, alkoxyalkyl having from 2 to 22 carbon atoms, haloalkyl having from 1 to 22 carbon atoms, cycloalkylalkyl having from 6 to 22 carbon atoms and alkenyl having from 3 to 22 carbon, R_2 and R_3 are members selected from the group consisting of hydrogen and R_1 and, when taken together, alkylene having from 3 to 4 carbon atoms, with the proviso that the sum of the carbon atoms in R_1, R_2 and R_3 is from 6 to 22. The novel hydroxyalkyl mercaptans are useful as insecticides and fungicides, emulsifiers and intermediates in chemical synthesis.

3,662,005

ALKYLATION OF ALKOXY-SUBSTITUTED AROMATIC COMPOUNDS

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 686,690, Nov. 29, 1967. This application May 25, 1970, Ser. No. 40,453

Int. Cl. C07c *43/20*

U.S. Cl. 260—612 D **6 Claims**

The alkylation of alkoxy-substituted aromatic hydrocarbons is effected in the presence of a novel catalyst comprising a hydrogen fluoride-carbon dioxide complex to prepare alkylated alkoxy-substituted aromatic compounds.

3,662,006

HYDROXYLATION OF AROMATIC COMPOUNDS

Stephen N. Massie, Palatine, and Robert E. Daum, Cary, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 12, 1969, Ser. No. 823,984

Int. Cl. C07c *43/22, 37/00*

U.S. Cl. 260—613 D **10 Claims**

The nuclear hydroxylation of aromatic compounds is effected by treating an aromatic compound with hydrogen peroxide in the presence of a catalyst comprising metal in the valent state of zero at hydroxylation conditions.

3,662,007

PROCESS FOR PREPARING DIHYDRO-β-SANTALOL FROM 3-ENDO-METHYL-3-EXO(4'-METHYL-5'-HYDROXYPENTYL)NORCAMPHOR

Wayne I. Fanta, Colerain Township, Hamilton County, and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,233

Int. Cl. C07c *35/00*

U.S. Cl. 260—631.5 **8 Claims**

A process for preparing dihydro-β-santalol from 3-endo-methyl-3-exo(4'-methyl - 5' - hydroxypentyl)norcamphor comprising the steps of (1) reacting 1-endo-methyl-3-exo(4'-methyl - 5' - hydroxypentyl)norcamphor with either boric acid or boric anhydride to obtain the borate ester of 3-endo-methyl-3-exo(4'-methyl - 5' - hydroxypentyl)norcamphor, and (2) reacting the borate ester reaction product of Step (1) with a phosphorus compound such as methyltriphenylphosphonium bromide and subsequently hydrolyzing the reaction product with water to obtain dihydro-β-santalol is disclosed. Dihydro-β-santalol is useful as a perfume component.

3,662,008

PROCESS FOR PREPARING β-SANTALOL FROM 3-METHYLNORCAMPHOR

Herbert C. Kretschmar, Greenhills, and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 21, 1969, Ser. No. 826,682

Int. Cl. C07c *35/02*

U.S. Cl. 260—631.5 **6 Claims**

A process for preparing β-santalol, useful in perfume compositions, from 3-methylnorcamphor comprising the steps of (1) alkylating 3-methylnorcamphor in strong base with an allyl halide; (2) reacting the reaction product of Step (1) with a methylmetallic compound, such as methyllithium, followed by hydrolysis; (3) brominating the reaction product of Step (2); (4) dehydrobrominating the reaction product of Step (3) with a base, such as sodium amide; (5) dehydrating the reaction product of Step (4) with a dehydrating agent, such as thionyl chloride; (6) reacting the reaction product of Step (5) with a compound, such as di(sec.-iso-amyl)borane followed by an oxidation; (7) reacting the reaction product of Step (6) with (carbethoxyethylidene)triphenylphosphorane; and (8) reducing the reaction product of Step (7) with a reducing agent, such as lithium aluminum hydride, to obtain β-santalol, and novel compounds produced therein are disclosed.

3,662,009

PREPARATION OF UNSATURATED FLUOROCOMPOUNDS

William M. Hutchinson, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 24, 1969, Ser. No. 879,101

Int. Cl. C07c *21/18, 43/28*

U.S. Cl. 260—653.3 **9 Claims**

Unsaturated fluorocompounds are produced by a combination of steps comprising (a) reacting a perhaloethylene with an unsaturated compound to produce a corresponding cyclobutane derivative, (b) fluorinating said cyclobutane derivative to obtain the corresponding perfluorocyclobutane derivative, (c) pyrolyzing said perfluorocyclobutane derivative to form the unsaturated perfluorocompound and said starting perhaloethylene, and (d) recycling at least a portion of said perhaloethylene formed in said step (c) to said step (a).

3,662,010

TRICYCLODECENE DERIVATIVES

Pierre Legendre, Arthez-de-Bearn, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,891

Claims priority, application France, Nov. 28, 1968, 175,735

Int. Cl. C07c *13/78*

U.S. Cl. 260—666 PY **12 Claims**

The invention relates to the preparation of unsaturated derivatives of tricyclodecene and, more particularly, of $(5,2,1,0^{2,6})$-tricyclo-8-decenes, of which the carbon atom in the 6-position carries an unsaturated hydrocarbon radical, comprising one or more double bonds. The invention is also concerned with these new products.

3,662,011

ISOMERIZATION OF ALKYL AROMATICS

Saul G. Hindin, Mendham, and Joseph C. Dettling, Jackson, N.J., assignors to Engelhard Minerals & Chemicals Corporation

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,122
Int. Cl. C07c 5/24, 15/02
U.S. Cl. 260—668 A 5 Claims

An improvement in a process for the isomerization of alkyl aromatic hydrocarbons over platinum on acidic silica-alumina catalysts comprises incorporating ceria in the catalyst.

3,662,012

DISPROPORTIONATION OF LONG-CHAIN MONOALKYL AROMATIC COMPOUNDS

George C. Feighner, Franklin Lakes, N.J., and Gene E. Nicks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of application Ser. No. 529,284, Feb. 23, 1966, which is a continuation-in-part of application Ser. No. 446,661, Apr. 8, 1965. This application July 6, 1970, Ser. No. 53,352
Int. Cl. C07c 3/62
U.S. Cl. 260—672 T 24 Claims

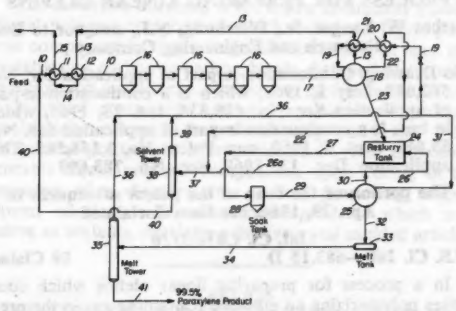
This disclosure concerns the preparation of a hydrocarbon composition containing a major amount of alkyl aromatic compounds having two long-chain alkyl groups and a minor amount of alkyl-substituted tetrahydronaphthalenes by the disproportionation of aromatic compounds having one long-chain alkyl group using aluminum chloride or aluminum bromide as the catalyst. The term "long-chain" refers to linear alkyl groups containing from about 8 to about 18, preferably from about 10 to about 16, carbon atoms. The hydrocarbon composition (i.e. disproportionated product) is useful as a sulfonation feedstock and as a lubricant.

3,662,013

SINGLE STAGE CRYSTALLIZATION PROCESS FOR SEPARATING HIGH PURITY PARAXYLENE

Eugene F. Machell, New Canaan, Conn., John E. Wylie, Manhasset, N.Y., and Robert B. Thompson, Wilton, Conn., assignors to Mobil Oil Corporation

Filed Feb. 3, 1970, Ser. No. 8,215
Int. Cl. C07c 7/14
U.S. Cl. 260—674 A 3 Claims



High purity (above 99%) paraxylene is recovered from a mixture of xylene isomers in a one-stage crystallization process. The mixture is cooled down to the eutectic temperature and filtered. The filter cake is washed with toluene and then slurried in wash effluent, refiltered and washed with toluene.

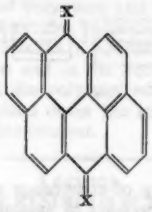
3,662,014

ADSORBING COMPOSITIONS, THEIR MANUFACTURE AND USE IN A PROCESS FOR SEPARATING ALKYLBENZENES FROM MIXTURES THEREOF

Rene Avrillon, Maisons Laffitte, and Daniel Defives, Paris, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Malmaison, Hauts-de-Seine, France

Filed May 7, 1970, Ser. No. 35,392
Claims priority, application France, May 9, 1969, 6915178
Int. Cl. C07c 7/12; B01j 11/40
U.S. Cl. 260—674 SA 14 Claims

The invention relates to new adsorbents comprising a zeolite base, e.g., a CaX zeolite, having pore diameters between 6 and 10 A., preferably about 8 A., and an active substance of the general formula



wherein X is an oxygen atom or a =N—R group, R being a monovalent hydrocarbon radical.

Examples of the active substances are anthanthrone and N,N'-diphenyl-anthanthrimine.

The adsorbents may further contain other substances such as water, pyranthrone or pyromellitic anhydride which improve their efficiency.

3,662,015

METHOD OF PREVENTING DOUBLE BOND MIGRATION OF MONO-OLEFINIC HYDROCARBONS IN SELECTIVE HYDROGENATION

Youji Komatsu, Ichihara-shi, Yasuhiro Furukawa, Funabashi-shi, and Takashi Yokomizo, Ichihara-shi, Japan, assignors to Maruzen Oil Company, Ltd., Osaka, Japan

Filed May 27, 1969, Ser. No. 828,186
Claims priority, application Japan, May 27, 1968, 43/35,522
Int. Cl. C07c 5/16
U.S. Cl. 260—677 H 14 Claims

Method of preventing double bond migration of a mono-olefinic hydrocarbon during the selective hydrogenation of a poly-unsaturated hydrocarbon (e.g. polyolefinic hydrocarbon, acetylenic hydrocarbon) coexisting with a mono-olefinic hydrocarbon, each of the mono-olefinic hydrocarbons and poly-unsaturated hydrocarbons having at least four carbon atoms, in the presence of hydrogen, using a palladium- or nickel-hydrogenation catalyst, which comprises adding carbon monoxide to the reaction system in an amount 1 to 50 mol. percent based on said hydrogen under selective hydrogenation conditions.

3,662,016

METHOD FOR THE PRODUCTION OF ISOPRENE

Itsuo Furuoya, Amagasaki, Katsuhiko Ogino, Toyonaka, Yoshio Kamatani, Osaka, and Kenji Naito, Toyonaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,766
Claims priority, application Japan, Aug. 2, 1969, 44/61,330
Int. Cl. C07c 1/00, 1/20; B01j 11/06
U.S. Cl. 260—681 5 Claims

Isoprene is produced in high yield by the condensation reaction between isobutylene and formaldehyde in the presence of a solid acid catalyst comprising silicon oxide and antimony oxide.

3,662,017

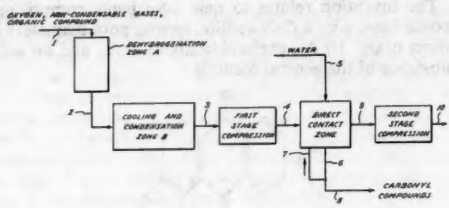
FOULING REDUCTION IN OXIDATIVE DEHYDROGENATION PROCESS

Rudolph C. Woerner, Houston, and Terry D. Funkhouser, La Porte, Tex., assignors to Petro-Texas Chemical Corporation, Houston, Tex.

Filed Aug. 4, 1970, Ser. No. 60,895

Int. Cl. C07c 3/00

U.S. Cl. 260—681.5 15 Claims



Reducing fouling of compressor pistons and cylinders used for the compression of gaseous compositions comprising unsaturated organic compounds and carbonyl compounds by compressing the gaseous composition with a multistage compressor with direct contact scrubbing of gases between compression stages. Preferred source of gaseous composition is from oxidative dehydrogenation process.

ERRATUM

For Class 260—683.68 see:
Patent No. 3,661,770

3,662,018

PROCESS OF IMPROVING THE SELECTIVITY OF DEHYDROGENATION CATALYSTS

Levi C. Parker, Port Arthur, Tex., and Charles A. Senn III, Greenville, S.C., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed May 15, 1970, Ser. No. 37,913

Int. Cl. C07c 3/28

U.S. Cl. 260—683.3 8 Claims

This invention concerns a process for improving the selectivity of noble metal-containing zeolite catalysts in dehydrogenation reactions comprising preliminarily contacting the catalyst for at least 18 hours at temperatures between 675° F. and 775° F. and preferably at space velocities of from about 2 to 5.

3,662,019

PRODUCTION OF MONOOLEFINS

Jan L. Stratenus, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed May 18, 1970, Ser. No. 38,584

Claims priority, application Netherlands, June 5, 1969, 6908540

Int. Cl. C07c 3/28

U.S. Cl. 260—683.3 7 Claims

Paraffins are dehydrogenated by contact with a supported noble metal catalyst, which additionally contains at least one metal of Groups II*b* and VII*b*, at a temperature of from 350° C. to 550° C. and in the presence of hydrogen.

3,662,020

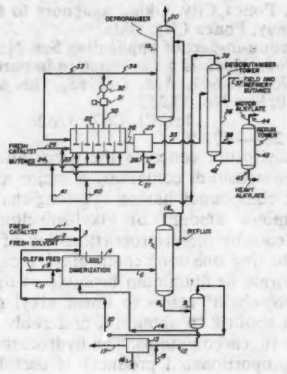
PROCESS FOR THE DIMERIZATION OF PROPYLENE AND ALKYLATION OF THE DIMER

Charles E. Hemminger, P.O. Box 103, Peapack, N.J. 07877, and Ivan Mayer, 145 Hillcrest Ave., Summit, N.J. 07901

Filed Feb. 9, 1970, Ser. No. 9,882

Int. Cl. C10c 3/10, 3/52, 3/54

U.S. Cl. 260—683.43 10 Claims



An integrated process prepares alkylated aliphatic hydrocarbons with (1) dimerization of a propylene-containing feed to produce a product containing a major amount of dimethylbutenes and (2) alkylation of the dimerization product with a C_3–C_5 olefin and isobutane to recover a product containing dimethylbutanes, isooctane and alkylate. The dimerization reaction is carried out with a specific catalyst complex while the alkylation catalyst may be either H_2SO_4, HF or crystalline aluminosilicate zeolites.

3,662,021

PROCESS FOR PREPARING LINEAR OLEFINS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 562,089, July 1, 1966, which is a continuation-in-part of application Ser. No. 428,836, Jan. 28, 1965, which in turn is a continuation-in-part of application Ser. No. 55,845, Sept. 8, 1960, now Patent No. 3,168,588. This application Dec. 13, 1968, Ser. No. 783,699

The portion of the term of the patent subsequent to Apr. 29, 1986, has been disclaimed

Int. Cl. C07c 3/10

U.S. Cl. 260—683.15 D 19 Claims

In a process for preparing linear olefins which comprises polymerizing an ethylene containing gas in the presence of a catalyst comprising the reaction product of a transition metal halide and an aluminum alkyl compound in the presence of a diluent and maintaining the mode ratio of ethylene to olefin reaction product at a relatively high level so as to produce a product comprising at least 90 mole percent linear olefins, the process is improved and the product purity is maintained by killing the activity of the catalyst prior to the occurrence of deleterious side reaction which tends to reduce the product purity.

3,662,022

CURABLE LIQUID COMPOSITION OF POLYENE, POLYMERCAPTAN AND ACRYLIC ACID

Edwin W. Lard, Bowie, Md., assignor to W. R. Grace & Co., New York, N.Y.

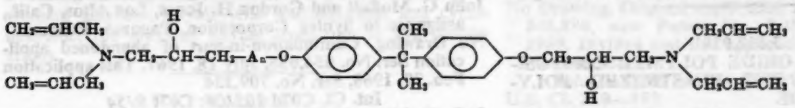
No Drawing. Continuation-in-part of application Ser. No. 74,185, Sept. 21, 1970. This application Nov. 2, 1970, Ser. No. 86,355

Int. Cl. C08g *45/04;* C08f *27/06*

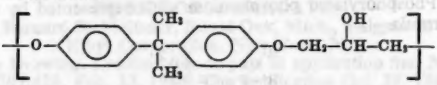
U.S. Cl. 260—837 R 9 Claims

A curable liquid composition consisting essentially of:

(a) a polyene having the formula



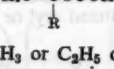
where A is



and *n* is essentially 0 or greater (e.g., 0–20); and

(b) a polythiol, the equivalent ratio of polyene to polythiol being about 1:0.5–1.5; and

(c) a member selected from a group consisting of a monomeric acid having the formula



where R is H, CH_3 or C_2H_5 or a homopolymer or copolymer of such monomeric acid having an average molecular weight of about 140–1000, the group member constituting about 2–10% by weight of the composition.

The above composition can contain an effective amount of a photocuring rate accelerator.

3,662,023

CHEMICALLY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITIONS

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 617,801, Feb. 23, 1967, which is a continuation-in-part of application Ser. No. 567,841, July 26, 1966. This application June 23, 1970, Ser. No. 49,207

Int. Cl. C08g *41/04, 11/54*

U.S. Cl. 260—858 26 Claims

The invention disclosed is for a new chemically curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The chemically curable liquid polymer composition upon curing in the presence of a chemical free radical generating reagent forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,662,024

UNSATURATED POLYESTER RESIN FORMATION IN UNSATURATED ESTER MONOMER AS SOLVENT

Charles E. Greene, Marion, Va., assignor to The General Tire & Rubber Company

No Drawing. Filed Nov. 24, 1970, Ser. No. 92,538

Int. Cl. C08f *21/00*

U.S. Cl. 260—863 12 Claims

Liquid compositions which are free of unreactive solvent and capable of being polymerized upon addition of free-radical polymerization catalysts (e.g., organic peroxide) into solid thermoset resins, are made by forming unsaturated polyesters having an average molecular weight of about 1,000 to 25,000 and an average of 6 to 110 double bond unsaturations, at least 50% of which are maleate unsaturations, by polymerization in the presence of a double metal cyanide complex catalyst of unsaturated dicarboxylic acid anhydrides and alkylene oxides in the presence of monomeric unsaturated esters that do not undergo appreciable copolymerization at temperatures of 100° C. or below, that are compatible with the unsaturated polyesters and that are capable of copolymerization with the polyesters. The monomeric unsaturated ester acts as a solvent for the polyester during its formation and in the liquid composition and serves to cross-link the polyester when the liquid composition is polymerized under the influence of the free-radical polymerization catalyst.

3,662,025

POLYMERIZABLE RESINOUS BLEND OF UNSATURATED POLYESTER RESIN AND POLYMERIZABLE MONOMER AND METHOD OF PREPARING THE SAME

Donald A. Buck, New City, N.Y., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Filed Oct. 20, 1970, Ser. No. 82,545

Int. Cl. C08f *21/00, 21/02*

U.S. Cl. 260—863 13 Claims

Polymerizable blend comprising (1) an unsaturated polyester resin prepared from (A) an alpha-beta-ethylenically unsaturated dicarboxylic acid or acid anhydride and (B) an excess of a polyhydric alcohol which is then reacted at a temperature ranging from about 150° C. to about 200° C. with (C) a phosphonate intermediate which is the reaction product of a phosphonate and an organic hydroxy acid or a lactone at a temperature ranging from about 110° C. to about 80° C. in the presence of a catalyst and (2) a polymerizable monomer containing a CH_2=CH group, said polymerizable resin blend possessing excellent flame-retardant properties, being very light in color, having long storage life and outstanding resistance to UV degradation, and method of making same.

3,662,026

PROCESS FOR PREPARING GRAFT COPOLYMERS CONTAINING N,N-DI(BETA-HYDROXYETHYL) GLYCINE SALTS

George L. Rushton, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed June 1, 1970, Ser. No. 42,574

Int. Cl. C08f *15/04*

U.S. Cl. 260—880 R 7 Claims

A composition comprising a graft copolymer resin and the alkali metal salt of N,N-di(beta-hydroxyethyl)glycine is characterized by improved color and gloss characteristics.

3,662,027

NITRILE TETRAPOLYMER-POLYVINYL-CHLORIDE BLENDS

Richard W. Czerwinski, Vienna, and Ralph P. Arthur, Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,213

Int. Cl. C08f *29/12, 29/56*

U.S. Cl. 260—891 13 Claims

A homogeneous blend of a vinyl halide polymer, particularly polyvinyl chloride (10 to 90%) with an im-

proved nitrile elastomer comprising, by weight, 30 to 90 parts butadiene, 10 to 50 parts acrylonitrile, 1 to 9 parts of an alkyl acrylate, and 1 to 9 parts α-chloroacrylonitrile. These blends, which are useful for mechanical goods, hose, electrical insulation and shoe soles, have been found to exhibit excellent color retention, superior abrasion resistance, and improved aging, compression set, and tear resistance properties. The improved physical properties permit the incorporation of larger amounts of low-cost extenders and fillers, thereby reducing overall compound costs.

3,662,028

VINYLIDENE CHLORIDE POLYMER COMPOSITIONS CONTAINING PLASTICIZED POLYVINYL CHLORIDE

William M. Wineland, deceased, late of Midland, Mich., by Elizabeth R. Wineland, executrix, Midland, Frank V. Goff, Sanford, and Fred Stevenson, Beaverton, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,857

Int. Cl. C08f *29/24*

U.S. Cl. 260—899 **2 Claims**

This invention is directed to vinylidene chloride polymer compositions and, in particular, to normally crystalline vinylidene chloride polymer compositions containing small but effective amounts of certain plasticized polyvinyl chlorides, which compositions are particularly useful for the preparation of essentially non-blocking, polymeric films having improved clarity.

3,662,029

PROCESS COMPRISING REACTION WITH ELEMENTAL PHOSPHORUS AND REACTION PRODUCT THEREOF

Chisung Wu, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Feb. 15, 1966, Ser. No. 527,492. Divided and this application May 21, 1969, Ser. No. 826,673

Int. Cl. C07f *9/02, 9/28, 9/40*

U.S. Cl. 260—920 **6 Claims**

Organophosphorus compositions produced by reacting (a) elemental phosphorus, (b) an epoxide or an episulfide, and (c) an alcohol or a mercaptan, in the presence of a catalytic quantity of a base, are further reacted with an activated olefin in proportions, at a temperature, and for a period of time sufficient to add said activated olefin to substantially all of the P-H moieties present in said organophosphorus compositions. The olefin-modified compositions can be oxidized to convert trivalent phosphorus to pentavalent phosphorus. The compositions have utility as flame-retardant additives for various polymeric systems including phenolic and epoxy resins.

3,662,030

PROCESS COMPRISING REACTION WITH ELEMENTAL PHOSPHORUS AND REACTION PRODUCT THEREOF

Chisung Wu, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Feb. 15, 1966, Ser. No. 527,492. Divided and this application May 21, 1969, Ser. No. 826,672

Int. Cl. C07f *9/08, 9/40*

U.S. Cl. 260—920 **4 Claims**

Organophosphorus compositions produced by reacting (a) elemental phosphorus, (b) an epoxide or an episulfide and (c) an alcohol or a mercaptan, in the presence of a catalytic quantity of a base reacting the product of (a), (b) and (c) with oxygen or other oxidizing agent in proportions, at a temperature and for a period of time sufficient to convert substantially all trivalent phosphorus to pentavalent phosphorus and thereafter reacting the product with an alkylene oxide to convert substantially all of the P–OH moieties in said organophosphorus composition to 2-hydroxyethoxyphosphorus groups. The compositions have utility in the preparation of urethane foams.

3,662,031

PHOSPHORYLATED PHOSPHONIUM YLIDS

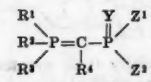
John G. Moffatt and Gordon H. Jones, Los Altos, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Continuation-in-part of abandoned application Ser. No. 654,056, July 18, 1967. This application Feb. 29, 1968, Ser. No. 709,234

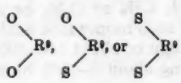
Int. Cl. C07d *105/04*; C07f *9/54*

U.S. Cl. 260—927 R **16 Claims**

Phosphorylated phosphonium ylids represented by the formula



wherein each of R^1, R^2 and R^3 is alkyl, cycloalkyl, aryl, or substituted aryl; R^4 is hydrogen, alkyl, cycloalkyl, aryl or substituted aryl; Y is oxygen or sulfur; and each of Z^1 and Z^2 is OR^5 or SR^6 wherein each of R^5 and R^6 is alkyl, alkenyl, aryl or substituted aryl or Z^1 and Z^2 together are



wherein R^9 is alkylene or arylene. The novel ylids are useful as intermediates in the preparation of phosphonic acid or thiophosphonic acid derivatives therefrom and as intermediates for the preparation of insecticides, herbicides, oil additives and 5′,6′-dideoxyhexofuranosylnucleoside 6′-phosphonic acid.

3,662,032

HYDROXY CONTAINING AROMATIC PHOSPHITES

Otto S. Kauder, Jamaica, and William E. Leistner, Brooklyn, N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

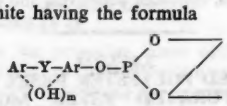
No Drawing. Continuation-in-part of application Ser. No. 160,237, Dec. 18, 1961. This application Feb. 25, 1966, Ser. No. 529,918

Int. Cl. C07f *9/12*; C08f *45/58*

U.S. Cl. 260—930 **6 Claims**

Organic phosphites are provided having in the molecule at least one polycarbocyclic phenolic group for each phosphite group, such polycarbocyclic phenolic group having from one to about thirty carbon atoms per phenolic group, and having the formula

and the phosphite having the formula



wherein Ar is a carbocyclic nucleus and at least one Ar nucleus has a phenolic hydroxyl group, *m* has a value from one to about five; and Z is taken in sufficient number to satisfy the valences of the two phosphite oxygen atoms and is selected from the group consisting of hydrogen, monovalent and bivalent organic hydrocarbon radicals having from about one to about twenty-

four carbon atoms, and monovalent and bivalent phenolic groups having from one to about thirty carbon atoms per phenolic hydroxyl group, and selected from the group consisting of $(HO)_m$—AR and

which in polymeric phosphites are linked to additional phosphite groups, such polymeric phosphites containing at least one alkyl group per phosphite group, and Y is a linking nucleus selected from the group consisting of oxygen, alkylene, oxyalkylene, sulfoalkylene and cyclohexylene, the alkylene having from one to five carbon atoms.

3,662,033

O,O-DIALKYL-S-DIARYL HYDROXYBENZYL PHOSPHORODITHIOATES

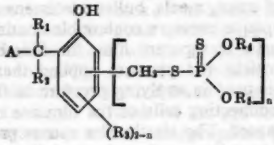
Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 707,428, Feb. 23, 1968. This application Oct. 29, 1968, Ser. No. 771,656

Int. Cl. C07f *9/18*; C08f *45/58*

U.S. Cl. 260—953 **9 Claims**

Styrene-butadiene rubber is stabilized by addition of a compound having the formula:



wherein A is an aryl radical containing from 6–18 carbon atoms, R_1 is a lower alkyl radical containing from 1–3 carbon atoms, R_2 is selected from hydrogen and lower alkyl radicals containing from 1–3 carbon atoms, R_3 is selected from the group consisting of alkyl radicals containing from 1–20 carbon atoms, cycloalkyl radicals containing from 6–20 carbon atoms and radicals having the formula:

wherein A, R_1 and R_2 are the same as above; R_4 and R_5 are independently selected from the group consisting of alkyl radicals containing from 1–50 carbon atoms and aryl radicals containing from 6–20 carbon atoms, and n is 1 or 2. An example is S-[3,5-di-(α-methylbenzyl)-4-hydroxybenzyl]-O,O-di-(C_{20-50} primary alkyl) phosphorodithioate. A process of making the compounds by the reaction of a 3,5 - di-hydrocarbyl-4-hydroxybenzyl halide with an O,O-di-hydrocarbyl dithiophosphoric acid in the presence of an alkali metal base or an alkaline earth metal base is also disclosed.

3,662,034

S-ALLYLIC AND S-VINYLIC O,S'-DIALKYL DITHIO-PHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Aug. 2, 1968, Ser. No. 749,575

Int. Cl. C07f *9/16*; A01n *9/36*; C10m *1/48*

U.S. Cl. 260—957 **20 Claims**

S-allylic and S-vinylic O,O'-dialkyldithiophosphates can be selectively dealkylated to form their corresponding salts, which then can be reacted with alkyl halides to form S-allylic and S-vinylic O,S'-dialkyldithiophosphates. Both the dealkylated products and the alkylated products are novel compositions, useful as pesticides, especially as insecticides, and as antioxidants, lubricating oil additives, etc.

3,662,035

MONOPHOSPHORIC ACID ESTERS OF HALOGENATED BIPHENOL

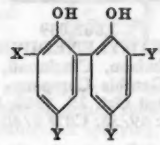
Samuel Van der Meer, Amstelveen, Willem Kruyt, Haarlem, and Hendrik Pouwels, Amsterdam, Netherlands, assignors to ACF Chemiefarma N.V., Amsterdam, Netherlands

No Drawing. Original application Apr. 28, 1966, Ser. No. 545,890, now Patent No. 3,482,016, dated Dec. 2, 1969. Divided and this application May 12, 1969, Ser. No. 841,658

Int. Cl. C07d *105/04*; C07f *9/12*; A01n *9/36*

U.S. Cl. 260—953 **2 Claims**

Monophosphoric acid esters of a biphenol of the formula



wherein X is H or halogen and Y is halogen. The compounds have utility as antiparasitics.

3,662,036

PROCESS FOR THE PREPARATION OF O-ETHYL-O-p-NITROPHENYL-ETHYLPHOSPHONATE

Masahiko Ikemoto, Honmachi, Kiyoshi Ito and Kazuhiko Kimura, Ohtsu-shi, and Teruo Nakanishi, Kyoto-shi, Kyoto-fu, Japan, assignors to Kakenyaku Kako Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Continuation-in-part of application Ser. No. 760,701, Sept. 18, 1968. This application June 24, 1969, Ser. No. 836,140

Int. Cl. C07f *9/40, 9/42*

U.S. Cl. 260—969 **3 Claims**

O-ethyl-O-p-nitrophenyl-ethylphosphonate is prepared by dioxyethylating trichlorophosphine, reacting the diethyl chlorophosphite so produced with an alkali metal salt of p-nitrophenol to produce diethyl-p-nitrophenyl phosphite, and reacting this last-mentioned compound with an ethyl halide under heat and pressure. O-ethyl-O-p-nitrophenyl-ethylphosphonate is effective in solution in sterile distilled water for the treatment of glaucoma and accommodative convergent strabismus by dropping into the eye.

3,662,037

PROCESS FOR PREPARING OPEN RING TETROSE AND TRIOSE PHOSPHATE ACETALS AND PHOSPHATE KETALS

Hans Ulrich Bergmeyer, Erich Haid, and Michael Nelboeck-Hochstetter, Tutzing, Upper Bavaria, and Otmar Pelz, Feldafing, Upper Bavaria, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

No Drawing. Filed July 1, 1969, Ser. No. 838,345

Claims priority, application Germany, July 5, 1968, P 17 68 844.7

Int. Cl. C07f *9/02*

U.S. Cl. 260—968 **14 Claims**

Process for preparing open ring tetrose and triose phosphate acetals and phosphate ketals comprising acetalizing or ketalizing free aldose or ketose phosphoric acid or an acid salt thereof in the anhydrous state in an organic solvent, without causing simultaneous esterification of free phosphoric acid group.

3,662,038

PROCESS COMPRISING REACTION WITH ELEMENTAL PHOSPHORUS

Chisung Wu, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Feb. 15, 1966, Ser. No. 527,492. Divided and this application May 21, 1969, Ser. No. 826,714

Int. Cl. C07f 9/02, 9/28, 9/40

U.S. Cl. 260—985 5 Claims

Process which comprises reacting (a) elemental phosphorus, (b) an epoxide or an episulfide, and (c) an alcohol or a mercaptan, in the presence of a catalytic quantity of a base, further reacting the product with an activated olefin to add said olefin to substantially all of the P—M moieties present in said product and thereafter oxidizing the resultant product to convert substantially all trivalent phosphorus in said reactant products to pentavalent phosphorus.

3,662,039

GENATED METHYLENEDIPHOSPHONATES

Denzel Allan Nicholson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Oct. 25, 1968, Ser. No. 770,860

Int. Cl. C07c 69/38; C07f 9/40; C10m 1/46

U.S. Cl. 260—986 9 Claims

Halogenated methylenediphosphonate esters (7 to 22 carbon atoms in each ester group), halogenated malonate esters (4–22 carbon atoms in each ester group), and halogenated phosphonoacetate esters (8 to 22 carbon atoms in each ester group) are disclosed, wherein the halogen is present on the bridging carbon atom between the ester moieties. The compounds have utility as extreme pressure and anti-wear additives for lubricant compositions. Also disclosed is a process for preparing said halogenated esters by reacting the corresponding unhalogenated esters with hypohalite ions in an aqueous reaction medium containing a water-miscible organic solvent.

3,662,040

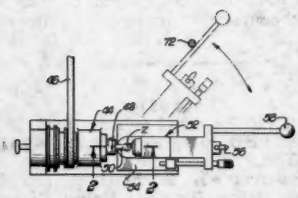
TECHNIQUE FOR LATHE GRINDING MULTIFOCAL CONTACT LENSES

Jacques Urbach, North Hollywood, and Harold W. Wiene, Pasadena, Calif., assignors to Uroptics International Incorporated, Los Angeles, Calif.

Filed Jan. 8, 1970, Ser. No. 1,444

Int. Cl. B29d 11/00

U.S. Cl. 264—1 8 Claims



A multifocal or bifocal contact lens is made on a convention radius turning lathe. The radius turning lathe has two supports, one for the work or lens blank and the other for the tool. The tool is rotated about an axis fixed on its support so that the point of the tool describes a circle. The blank is held fixed on its support. Upon relative angular movement of the supports, a spherical segment is cut in the blank, with the center of curvature falling along the axis of rotation of the tool whereby monocentricity is achieved. By such grinding technique, a segment for near view may be formed having a desirable configuration in which nasal rotation of the lens is noncritical.

3,662,041

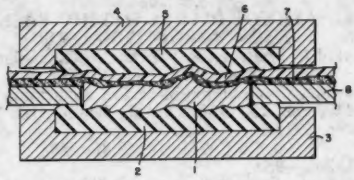
PROCESS OF PRODUCING OPTICALLY PROJECTABLE REPLICAS OF PRESSURE COALESCIBLE FILM

Robert B. Hartman, Bridgeport, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation of application Ser. No. 838,007, June 16, 1969. This application Oct. 5, 1970, Ser. No. 78,168

Int. Cl. B29c 17/00; B29d 7/22

U.S. Cl. 264—1 2 Claims



A process for producing optically projectable replicas of surfaces of coins, meals, bullet specimens and the like wherein an opaque pressure coalescible coating is mounted on an elastic transparent film, the film being placed against the article and pressure applied thereto. A soft backing pad is used in applying pressure to the film. The minute interconnecting cells of the film are opaque until they are collapsed. The elastic film causes pressure to be applied to the coating so that the major and minor surfaces, together with gradations therebetween, will be replicated.

3,662,042

METHOD OF MAKING A NUCLEAR REACTOR FUEL ELEMENT OF URANIUM MONONITRIDE IN A REFRACTORY METAL MATRIX

Donald E. Kizer, Columbus, Ohio, Roy A. Smith, Easton, Pa., and Edward O. Speidel, Columbus, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,685

Int. Cl. C01g 1/08, 43/00; G21c 21/02

U.S. Cl. 264—.5 7 Claims

A high-temperature dimensionally stable nuclear reactor fuel element of uranium mononitride in a refractory metal matrix having evenly distributed porosity is prepared by cold pressing a mixture of a powdered refractory metal and powdered U_2N_3, forming a body which is then densified by heating under pressure to prevent complete decomposition of the U_2N_3. The densified body is then heated to decompose the U_2N_3 to UN, leaving evenly distributed porosity throughout the element.

3,662,043

PROCESS FOR MAKING A POLYURETHANE FOAM/EXPANDABLE THERMOPLASTIC PARTICLE COMPOSITE WITH HIGH FREQUENCY ELECTRICAL HEATING

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 11, 1970, Ser. No. 36,432

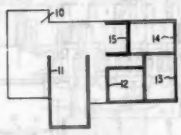
Int. Cl. B29d 27/04; B29h 5/26

U.S. Cl. 264—26 5 Claims

Where the exotherm from the polyurethane reaction is insufficient to cause expansion of expanded thermoplastic particles (beads) dispersed therein the particles may be substantially fully expanded by subjecting the composite foam to high frequency electrical energy for a time

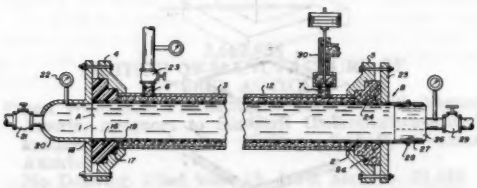
sufficient to expand them. This improved process is rapid, readily controlled and produces improved foam composites.

3,662,044
METHODS OF BUILDING
Daniel Marie Kuter, Immeuble Menard, Vallee des Colons, Noumea, New Caledonia
Filed Nov. 25, 1970, Ser. No. 92,785
Claims priority, application Australia, Jan. 7, 1970, 26/70
Int. Cl. E04b 1/16; E04g 11/08
U.S. Cl. 264—34 2 Claims



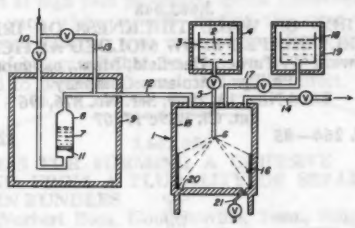
A method of building houses or flats which is intended to provide the economic advantages of prefabrication by the use of relatively simple on-site techniques in which a concrete slab is laid over the ground area of the building and on this three walls of a first room are cast in reinforced concrete by means of formwork and subsequently a roof is cast over them. This procedure is then continued in respect of each of the rooms of the house, the rooms being arranged so that the open space left by the absence of a fourth wall is closed wholly or partially by a wall of an adjacent room. The roof of the building is completed by pouring additional concrete slabs to cover corridors left between the rooms as a result of the previous steps. Internal doorways are provided at appropriate places in the walls between adjacent rooms, door and window frames being fixed in position in the walls during casting together with conduits for electricity and other services and weatherproof sealing means are provided at the junction of adjacent rooms where required. In building a multistorey building the roof of the building produced as described above is used as the floor slab for the next floor and the same procedures are then followed and repeated for each subsequent floor.

3,662,045
METHOD FOR PROVIDING A CEMENT SHEATHED PLASTIC LINER WITHIN A FLOWLINE
Kenneth Tierling, 39 Heron Road, Sherwood Park, Alberta, Canada
Filed Apr. 24, 1970, Ser. No. 31,651
Int. Cl. B32b 31/06
U.S. Cl. 264—35 2 Claims



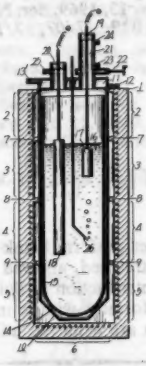
A thermoplastic liner is threaded into an oilfield flowline. An annular space is defined between liner and flowline. The liner is cemented in place by: plugging one end of the liner and the two ends of the annular space; filling the liner with water; pumping cement into the annulus while controlling the cement pumping pressure and the liner pressure so that the pressure within the liner is always greater than the pressure in the annulus but less than the liner rupture pressure.

3,662,046
METHOD OF MAKING REVERSE OSMOSIS MEMBRANES FOR DESALINATION OF WATER
Jung Woo Woo, Arlington, Va., Paul F. Waters, Washington, D.C., and Raymond H. Horowitz, Silver Spring, and Albert F. Hadermann, Ijamsville, Md., assignors to the United States of America as represented by the Secretary of the Interior
Filed June 3, 1970, Ser. No. 43,049
Int. Cl. B29d 7/20
U.S. Cl. 264—41 14 Claims



Reverse osmosis membranes are produced by spraying a film-forming solution onto a substrate in a zone into which is injected, throughout spraying, an inert gas saturated with polymer solvent vapor. Solvent is then evaporated from the film by reducing the degree of solvent saturation of the inert gas in the evaporation zone by introducing gas that is less than saturated with solvent, by lowering the atmospheric pressure in the zone or by heating the atmosphere. The film is then cured in the prior art manner by quenching and annealing. Electrostatic spraying is most effective.

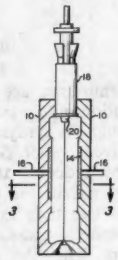
3,662,047
ELECTRODEPOSITION METHOD
Shin-ichi Tokumoto and Eiji Tanaka, Kanagawa, Japan, assignors to Sony Corporation, Shinagawa-ku, Tokyo, Japan
Filed Apr. 9, 1970, Ser. No. 26,845
Claims priority, application Japan, Apr. 14, 1969, 44/28,836
Int. Cl. C22d 3/00, 3/20
U.S. Cl. 204—64 T 32 Claims



A method for the electrodeposition of titanium or its alloys is shown. A fused salt electrolytic bath containing (1) a mixture of the chloride salts of barium, magnesium, sodium and calcium having a freezing point of less than 600° C., and (2) titanium dichloride, and if desired, (3) a source of a suitable alloy metal is electrolyzed. The electrolytic bath is maintained at a temperature of 400° C. to 580° C. and under such conditions as will maintain the molar ratio of titanium trichloride to titanium dichloride less than 0.5 in the vicinity of the electrode to be

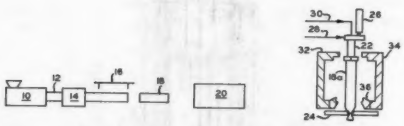
electrodeposited. A portion of the bath is desirably maintained at a temperature above 500° C. to convert titanium trichloride to titanium dichloride to maintain the above molar ratio near the cathode. A unique polarized region is formed about the cathode as magnesium is simultaneously electrodeposited with titanium or its alloy and then rehalogenized into the electrolyte. The plate product is smooth in surface and numerous capital and operating efficiencies are achieved.

3,662,048
CONTROL OF WALL THICKNESS OF IRREGULARLY SHAPED BLOW MOLDED ARTICLES
Edward W. Turner, Deerfield, Mass., assignor to Phillips Petroleum Company
Filed Nov. 13, 1969, Ser. No. 876,496
Int. Cl. B29c 17/07
U.S. Cl. 264—85 **12 Claims**



Irregularly shaped blow molded articles such as bottles having a generally flat configuration are produced having a more uniform wall thickness by providing a thin film of gaseous fluid between an expanding parison and the first portion of the mold wall to be contacted and/or providing a gaseous fluid jet to cool the portion of the parison which is expanding toward the side walls at the ends of the longer axis of the mold.

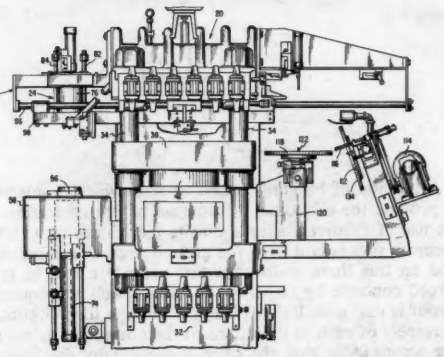
3,662,049
ORIENTED ARTICLES FROM RETRACTED BLANK
Dixie E. Gilbert, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Nov. 13, 1969, Ser. No. 876,309
Int. Cl. B29c 17/07, 17/14, 25/00
U.S. Cl. 264—89 **12 Claims**



A parison or other preform blank is heated to orientation temperature, stretched, allowed to contract, and restretched prior to introduction of fluid pressure to expand same out into conformity with a mold zone. Improved clarity and strength are achieved utilizing this technique.

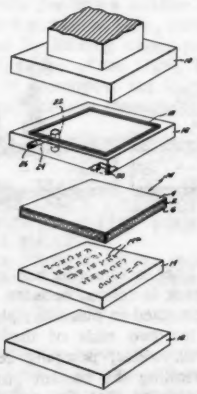
3,662,050
METHOD FOR MAKING MOLDED PRINTING PLATES
John A. Willett, 21 Benvenue St., Wellesley, Mass. 02181
Filed Apr. 19, 1968, Ser. No. 722,731
Int. Cl. B29c 1/02, 25/00; B29d 9/02; B41c 3/06
U.S. Cl. 264—102 **6 Claims**

An improved duplicate printing plate of the letter press class is made from a gelled sheet of fluid printing plate material. The gelled sheet is required to be prepared under selectively controlled heating conditions. The selectively heated printing plate material thus produced is characterized by body and handling strength such that it may be manipulated and contained in an evacuated molding press. In the press the material is subjected to heat and pressure while in contact with a female mold. An important consideration is control of heating to maintain the gelled sheet in a state of limited plasticity so that cold



flowing is possible at the time the sheet is introduced into the press. In this limited state of plasticity the material throughout its layer thickness may, under suitable heat and pressure, be displaced into intimate contact with the mold depressions at all points therein. Continuing heat and pressure then converts the displaced plastic or gelled material into a completely fused and cured rubber-like mass to produce a permanently molded letter press printing plate which is free from stresses.

3,662,051
AUTOMATIC RECORD MOLDING APPARATUS AND METHOD
Loraine C. Harlow, Greenfield, and Stephen D. Ransburg and Lester L. Mehaffey, Indianapolis, Ind., assignors to RCA Corporation
Filed Feb. 25, 1969, Ser. No. 801,972
Int. Cl. B29d 17/00
U.S. Cl. 264—107 **17 Claims**



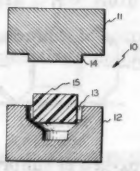
An automatic record press apparatus includes means for assembling for transport to the molding press portion

of the apparatus, a sandwich arrangement consisting of a quantity of moldable material having adhered thereto on opposing surface areas, top and bottom record labels.

3,662,052
IMPACT MOLDING OF OXYBENZOYL POLYESTERS

Bernard E. Nowak, Lancaster, and James Economy and Steve G. Cottis, Buffalo, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed May 28, 1969, Ser. No. 828,632
Int. Cl. B29f *5/02*; C08g *17/00, 39/00*
U.S. Cl. 264—119 **10 Claims**



Processes for forming shaped polyester articles of an oxybenzoyl polyester comprising compressing granules of the oxybenzoyl polyester into a slug and impact compressing the said slug into a desired shape by imparting to said slug an energy of from 10,000 foot pounds to 150,000 foot pounds.

3,662,053
PROCESS FOR COATING DIRECTLY VINYLIDENE CHLORIDE LATEX ON VINYL CHLORIDE RESIN MOLDINGS

Shinsuke Yoshikawa, Akira Yamamoto, and Masashi Kumasaka, Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed July 1, 1970, Ser. No. 51,698
Claims priority, application Japan, July 1, 1969, 44/51,463
Int. Cl. B32b *27/08*
U.S. Cl. 264—129 **13 Claims**

A process for coating a vinyl chloride resin molding with a vinylidene chloride latex which comprises coating said molding immediately after molding said molding at a temperature of from 100 to 230° C. and while said molding is at its melting temperature, is disclosed.

3,662,054
METHOD OF MANUFACTURE OF RUBBER ARTICLES

Ernest Wollmann, Pottschach, and Josef Zartl, Vienna, Austria, assignors to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Viennna, Austria

No Drawing. Filed Mar. 19, 1970, Ser. No. 21,208
Claims priority, application Austria, Mar. 21, 1969, A 2,846/69
Int. Cl. B29c *25/00*
U.S. Cl. 264—131 **3 Claims**

A method of producing a rubber article manufactured according to the latex dipping method, in which the surface to come into contact with the human body is treated and prepared respectively with a buffer substance tolerated by the skin, selected from the group consisting of esters of oxy-benzoic acid, in order to neutralize traces of alkalis.

3,662,055
PRODUCTION OF VARIABLE DENIER YARNS OF SYNTHETIC POLYMERS

John Richard Bates, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

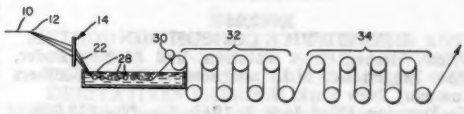
No Drawing. Filed May 22, 1969, Ser. No. 827,074
Claims priority, application Great Britain, June 12, 1968, 27,906/68
Int. Cl. D01d *5/20*
U.S. Cl. 264—167 **12 Claims**

A process for making variable denier yarn of synthetic polymers at high yarn processing speeds comprises drawing the yarn while variably heating the same with a hot gaseous medium such as a narrow flame or jetted stream of hot gas. Either the yarn or the flame may be deflected to produce the variable heating effect.

3,662,056
PROCESS FOR FORMING A COHESIVE TOW BAND FROM A PLURALITY OF SEPARATE YARN BUNDLES

Wilbur Norbert Ross, Goodlettsville, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 20, 1970, Ser. No. 56,518
Int. Cl. D02j *1/22*
U.S. Cl. 264—290 R **6 Claims**



A tow drawing process in which a cohesive tow band is prepared from multiple yarn filament bundles by passing the bundles before combining them through a multi eyelet guide in which the eyelets are arranged in three stacked parallel rows. The outer rows are oscillated with respect to the center row so that the bundles cross and uncross each other to provide a tow band having a low level of filament intermingling.

3,662,057
METHOD OF FORMING AN EXPANDED POLYETHYLENE CAST ON A LIVING BODY

Joseph George Webster, Croydon, and William Henry Tuck, Kenton, England, assignors to Bakelite Xylonite Limited, London, England

Continuation of application Ser. No. 731,253, May 22, 1968. This application Oct. 21, 1969, Ser. No. 868,242
Claims priority, application Great Britain, May 25, 1967, 21,473/67
Int. Cl. B29d *27/00*
U.S. Cl. 264—321 **1 Claim**

Method of forming a cast for a living body from a sheet of partially cross-linked nitrogen expanded low density polyethylene having a thickness of between about 0.3

centimeters and about 2.5 centimeters. The method comprises heating the sheet to a temperature between 130° C. and 150° C. to render it pliable, then bringing the sheet into contact with a portion of a living body, shaping it so as to complement the portion of the living body and cooling the sheet to cause it to resume its original rigidity.

3,662,058

UTILIZATION OF MOLTEN SLAG FROM METALLURGICAL FURNACE IN MANUFACTURE OF FUSED CAST REFRACTORY SHAPES

Giovanni Crespi, Milan, Italy, assignor to Siderpatents, S.A., Lugano, Switzerland

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,792
Claims priority, application Switzerland, Feb. 20, 1968, 2,439/68
Int. Cl. C04b 5/00, 35/62, 35/02
U.S. Cl. 264—332 17 Claims

Dolomite or magnesite either preheated or at room temperature is added directly to the molten slag in the furnace during the normal processing of a "heat" to raise the melting point of the slag-refractory mixture to at least 1800° C. This modified slag mixture is then cast into molds to form refractory shapes. Granular refractory material can also be added to the mold either prior to or simultaneous with the addition of the modified slag.

3,662,059

DENTIFRICE COMPOSITION

Wilfried Wiesner, West Paterson, and Morton Pader, West Englewood, N.J., assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed June 2, 1969, Ser. No. 829,799
The portion of the term of the patent subsequent to Nov. 3, 1987, has been disclaimed
Int. Cl. A61k 7/16
U.S. Cl. 424—52 22 Claims

This disclosure relates to a dentifrice composition containing a polymer of an olefin having 2 to 3 carbon atoms, a fluorine-containing compound and a silica xerogel. This dentifrice composition has a pH of about 4.5 or less.

3,662,060

TOOTHPASTES COMPRISING STABILIZED MILLED ALPHA-ALUMINA TRIHYDRATE

John Walter Clippingdale, Egham, and Charles Andrew Watson, Ruislip, England, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Oct. 14, 1969, Ser. No. 866,397
Claims priority, application Great Britain, Oct. 29, 1968, 51,285/68
Int. Cl. A61k 7/16
U.S. Cl. 424—57 3 Claims

Using milled alpha-alumina trihydrate as a toothpaste abrasive can sometimes give rise to corrosion of unlacquered aluminum tubes accompained by the production of hydrogen gas. This can be prevented by stabilising the alumina by the action thereon of orthophosphate ions.

3,662,061

NOVEL LIP COLORING COSMETICS AND METHODS OF MAKING SAME

Felix Lachampt and Charles Zviak, Franconville, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

No Drawing. Filed June 21, 1968, Ser. No. 738,841
Claims priority, application Luxembourg, June 30, 1967, 54,005
Int. Cl. A61k 7/02
U.S. Cl. 424—64 2 Claims

A salt of a bromo acid dye and an amine is dispersed in a fatty substance of the type used in the manufacture of lipsticks and the like.

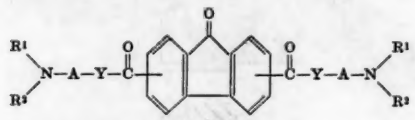
3,662,062

ANTIVIRAL COMPOSITIONS AND METHODS OF USE

Russell F. Krueger, Cincinnati, Harry W. Ritter, Sharonville, and Arthur D. Sill, Greenhills, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 818,412, Apr. 22, 1969, which is a continuation-in-part of application Ser. No. 720,332, Apr. 10, 1968, which in turn is a continuation-in-part of application Ser. No. 607,383, Jan. 5, 1968. This application Sept. 2, 1970, Ser. No. 69,144
Int. Cl. A61k 27/00
U.S. Cl. 424—85 17 Claims

Antiviral compositions and methods for inhibiting or inactivating viruses by subjecting a host to an antivirally effective quantity of a fluorenone of the following Formula I or acid addition salt thereof.



Formula I

wherein each Y is oxygen or sulfur; each A is alkylene of 2 to about 8 carbon atoms; and each R^1 and R^2 is hydrogen, alkyl of 1 to about 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, or each set of R^1 and R^2 together with the nitrogen atom to which they are attached can be a saturated monocyclic heterocyclic group. An illustrative fluorenone used in the invention is bis(3-dibutylaminopropyl)-9-oxofluorene-2,7-dicarboxylate dihydrochloride.

3,662,063

METHODS FOR STIMULATING THE GROWTH OF POULTRY WITH COUMERMYCIN

Julius Berger, Passaic, and Wilbur Lewis Marusich, Wayne, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 742,506, July 5, 1968. This application Apr. 24, 1969, Ser. No. 819,525
Int. Cl. A61k 21/00
U.S. Cl. 424—181 5 Claims

A composition and method for stimulating the growth of poultry and enhancing feed efficiency is described. The composition comprises the known antibiotic, coumermycin, in admixture with an edible, non-toxic diluent or carrier, the diluent or carrier preferably being a material which is a nutrient for poultry.

The method comprises feeding poultry, ad libitum, a ration which contains a ratio of from about 1.0 gram to about 50.0 grams of coumermycin per ton of feed.

3,662,064

REDUCTION OF THE PHYTOTOXICITY OF FUNGICIDIAL COMPOSITIONS CONTAINING MANGANESE ETHYLENE BISDITHIOCARBAMATE

Romke Wijmenga and Jan Wunderink, Soest, Netherlands, assignors to N.V. Chefaro Maatschappij

No Drawing. Filed Mar. 25, 1969, Ser. No. 810,342
Claims priority, application Netherlands, Apr. 4, 1968, 6804715
Int. Cl. A01n 9/20, 9/02
U.S. Cl. 424—145 1 Claim

The phytotoxicity of fungicidal compositions containing at least 80 wt. percent of manganese ethylene bisdithiocarbamate is reduced by intimately admixing therewith zinc oxide in an amount of from 0.1 to 10 wt. percent and most preferably from 0.5 to 3 wt. percent, based

on the weight of manganese ethylene bisdithiocarbamate in the composition. The reduction of phytotoxicity is further enhanced by the addition to the aforementioned fungicidal compositions of a phenolic compound selected from among catechol, p-hydroquinone, metol, pyrogallol and propyl gallate, and which is added in an amount from 0.01 to 5 wt. percent, and most preferably from 0.1 to 1 wt. percent based on the weight of manganese ethylene bisdithiocarbamate.

3,662,065

CHLORO SUBSTITUTED BENZYL TRIPHENYL PHOSPHONIUM HALIDES AS ANTHELMINTICS

Robert J. Balske, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Feb. 9, 1970, Ser. No. 9,950
Int. Cl. A61k *27/00;* A01n *9/36*
U.S. Cl. 424—198 7 Claims

Usage of chloro substituted benzyl triphenylphosphonium halides for combating helminthiasis in animals.

3,662,066

COMPOSITIONS FOR INHIBITING ANOMALOUS DEPOSITION AND MOBILIZATION OF CALCIUM PHOSPHATE IN ANIMAL TISSUE

Marion D. Francis, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 709,883, Mar. 4, 1968. This application Mar. 4, 1970, Ser. No. 16,557
Int. Cl. A61k *27/00*
U.S. Cl. 424—204 7 Claims

Compositions for inhibiting anomalous deposition and mobilization of calcium phosphates in animal tissue, comprising an effective amount of a cyclic tetraphosphonic acid or a salt thereof, in a pharmaceutical carrier; and a method for treating conditions involving pathological calcification and hard tissue demineralization in an animal comprising administering to such animal said compositions.

3,662,067

FUNGICIDAL METHOD AND COMPOSITION

Georges A. L. Richard, Bougival, Jean-Marie F. Cognet, La Celle-Saint-Cloud, Jean Heullant, Le Raincy, and Jean-Pierre Vallier, Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,317
Claims priority, application France, Mar. 27, 1968, 145,625; Dec. 30, 1968, 181,920
Int. Cl. A01n *9/02, 9/12*
U.S. Cl. 424—245 4 Claims

Fungicidal mixtures for seed treatment containing as active ingredients a mixture of a metal salt of a hydroxyquinoline and 2,3-dihydro-5-carboxanilido-6-methyl-1,4-oxathiin.

3,662,068

PROCESS AND COMPOSITION FOR BOTFLY LARVAE ELIMINATION

Richard J. Mack, Overland Park, Kans., assignor to Richardson-Merrell, Inc., New York, N.Y.

No Drawing. Filed June 11, 1970, Ser. No. 45,579
Int. Cl. A61k *27/00*
U.S. Cl. 424—253 27 Claims

The use of choline xanthate to treat equine to eliminate botfly larvae from their gastrointestinal tract is improved by the concurrent use of an acidifying agent capable of releasing carbon disulfide from the choline xanthate upon reaction therewith. Novel coated and uncoated choline xanthate and acidifying substance mixtures are disclosed for this use.

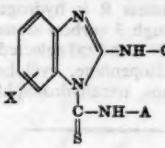
3,662,069

ALKYL 1-(N-SUBSTITUTED THIOCARBAMOYL)-2-BENZIMIDAZOLECARBAMATES AS FUNGICIDES AND MITE OVICIDES

Bruce I. Dittmar, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 16, 1969, Ser. No. 825,405
Int. Cl. A01n *9/22*
U.S. Cl. 424—273 8 Claims

The novel compounds of the following structure are useful as fungicides and mite ovicides:



wherein

R_1 is methyl, ethyl, isopropyl or sec-butyl;
X is hydrogen, halogen, methyl, methoxy or nitro; and
A is various acyl, alkoxycarbonyl or alkyl sulfonyl groups.

These compounds are made by the reaction of an alkyl 2-benzimidazolecarbamate with a N-substituted isothiocyanate.

An exemplary specie of this class is 1-[(methoxycarbonyl)-thiocarbamoyl]-2-benzimidazolecarbamate.

3,662,070

METHOD OF TREATMENT OF EMESIS AND NERVOUS TENSION IN MAMMALS WITH CERTAIN INDOLES-2-CARBOXAMIDES AND DERIVATIVES THEREOF

Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de L'Ile-De-France, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 657,010, July 31, 1967, now Patent No. 3,573,325, dated Mar. 30, 1971. This application Jan. 6, 1971, Ser. No. 104,500
Claims priority, application France, July 29, 1966, 72,905; Oct. 18, 1966, 80,482
Int. Cl. A61k *27/00*
U.S. Cl. 424—274 8 Claims

Emesis and/or nervous tension in mammals are substantially diminished by administration of certain N-(1-alkyl-2-pyrrolidylmethyl)-3-alkoxy (or hydroxy)-indoles-2-carboxamides. Treatment may be given orally or parenterally.

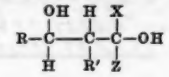
3,662,071

PHARMACEUTICAL COMPOSITION COMPRISING CERTAIN 1,3-SUBSTITUTED GLYCOLS

Carl M. Langkammerer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 17, 1966, Ser. No. 551,884
Int. Cl. A61k *27/00*
U.S. Cl. 424—275 2 Claims

1. A pharmaceutical composition comprising a pharmaceutically acceptable diluent and an effective pharmaceutical dose of a compound of the formula:



wherein

R is selected from the group consisting of hydrogen, alkyl of 1 through 4 carbon atoms, alkenyl of 2 through 4 carbon atoms, naphthyl, thienyl, furyl, and

A is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, sulfonylamide, methyl, methoxy and phenyl;

D and E are separately selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, sulfonylamide, methyl and methoxy;

X and Z are separately selected from the group consisting of trifluoromethyl and chlorodifluoromethyl;

R' is selected from the group consisting of hydrogen and alkyl of 1 through 7 carbon atoms with the limitation that unless R is hydrogen the alkyl can have only 1 through 3 carbon atoms; and R and R' are joined to form a radical selected from the group consisting of cyclopentane, cyclohexane, cyclohexene, cyclododecane, tetrahydronaphthalene and norbornane.

3,662,072

FEEDSTUFF CONTAINING SALICYL SALICYLIC ACID

Ingvar Wiberger, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,850
Claims priority, application Sweden, Apr. 3, 1969, 4,857/69
Int. Cl. A61k *27/00*
U.S. Cl. 424—230 **2 Claims**

A feedstuff, primarily intended for pigs and poultry, said stuff containing salicyl salicylic acid as a growth stimulant.

3,662,073

MEDICINAL MIXTURE FOR ALLEVIATION OF PAINFUL CONDITIONS AND METHOD FOR USING SAME

Dietrich Lorenz, Bensberg, Germany, assignor to Troponwerke Dinklage & Co., Cologne-Mulheim, Germany

No Drawing. Filed Apr. 24, 1969, Ser. No. 819,535
Claims priority, application Germany, Apr. 30, 1968, P 17 67 344.8
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 **4 Claims**

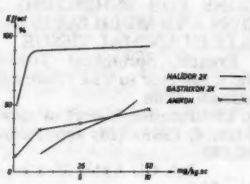
A composition comprising (+)-1-benzyl-3-dimethylamino-2-methyl-1-phenylpropylpropionate (I) admixed with a compound selected from the group consisting of 2-chloro-9-(γ - dimethylaminopropylidene)-thioxanthene (II), 2 - chloro-9-[3-(N'-β-hydroxyethylpiperazino)-propylidene]-thioxanthene (III) and 2-trifluoromethyl-9-[3-(N'-β-hydroxyethylpiperazino)-propylidene]-thioxanthene (IV). Specific compositions are those in which the weight ratios of the components and, in the case of I and II, and I and III, from 1:1 to 64:1, and in the case of I and IV from 1:1 to 200:1. The compositions may be administered in dosage unit form. The analgesic effect of I and II, III or IV is more than additive, but the sedative effect of II, III or IV is not substantially affected.

3,662,074

PHARMACEUTICAL COMPOSITIONS OF ANTI-ULCEROUS ACTIVITY

Lajos Voroshazy, Budapest, and Karoly Thuranszky and Andras Kekes-Szabo, Szeged, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar

Filed May 1, 1969, Ser. No. 820,950
Claims priority, application Hungary, May 9, 1968, VO-139
Int. Cl. A61k *27/00*
U.S. Cl. 424—265 **2 Claims**



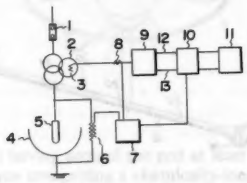
A pharmaceutical composition having synergetic ulcer-inhibiting activity contains as its active ingredients 0.5 to 1.5 parts by weight of triopine-xanthene-9-carboxylic acid ester metho-bromide (Gastrixon), 50 to 150 parts by weight of 1-benzyl-1-(3-dimethylamino-propoxy)-cycloheptane or its fumarate (Halidor) and optionally 0.5 to 1.0 part by weight of 2-diethylaminoethyl-benzylate (Amikon).

ELECTRICAL

3,662,075
METHOD AND SYSTEM FOR CONTROLLING ELECTRIC FURNACES AS A FUNCTION OF POWER FACTOR

Makoto Sakai, and Shinichi Miyao, both of Niigata, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Oct. 22, 1970, Ser. No. 82,898
Claims priority, application Japan, Oct. 30, 1969, 44/86640
Int. Cl. F27d *11/10*
U.S. Cl. 13—13 10 Claims



In an electric furnace control system of the type wherein an electrode driving mechanism is operated by the electrode control signals provided by an automatic current regulator responsive to the current flowing through the electrode, there are provided a program control connected between the automatic current regulator and the electrode driving mechanism for transmitting the electrode control signals to the electrode driving mechanism, and a power factor regulator responsive to the actual power factor of the furnace for controlling the program control.

3,662,076
CARDIAC TRAINING MANNIKIN

Michael S. Gordon, Miami, Fla., and Francis B. Messmore, New York, N.Y., assignors to Research Corporation, New York, N.Y.

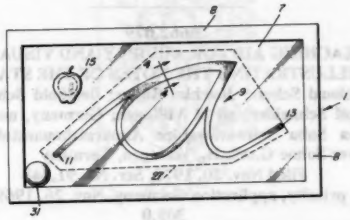
Filed Apr. 22, 1970, Ser. No. 30,831
Int. Cl. G09b *23/32*
U.S. Cl. 35—17 14 Claims

A training mannikin is disclosed for particular use in simulating various normal and abnormal cardiac conditions in the human body. The mannikin resembles in texture and appearance at least the upper portion of the human body, and has in its interior pulse-producing means including plunger means to simulate pulse points, and sound-producing means to simulate heart beat. Selectively interchangeable cam-operated control means are provided to operate the plunger means in a variety of sequence patterns to simulate a number of normal and abnormal cardiac conditions.

3,662,077
EDUCATIONAL DEVICE

Emile V. Kersten, P.O. Box 202, Avondale, Colo.

Filed Aug. 5, 1970, Ser. No. 61,072
Int. Cl. G09b *11/04*
U.S. Cl. 35—37 7 Claims

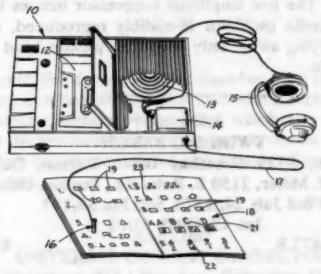


A device for teaching children writing skills. A housing having a top provided with a visible letter of the alphabet, a starter button which must be depressed by the right hand or the left hand of the child during operation and an object or symbol representing the letter being written which is illuminated upon successful completion of the tracing of the letter. A magnetic pencil with which the child follows or traces the letter indicia on the top, a steel ball which follows the course of the magnetic pencil in tracing the particular letter. A source of current, an electric circuit and an electric switch positioned at the end of the letter and closed by the magnetic ball when the ball reaches this point to thereby illuminate the object or symbol upon successful completion of tracing the letter. The attraction of the ball by the magnetic pencil is lost if the child tracing the letter indicia lets the pencil deviate from said letter indicia, if this occurs the ball will fall into a collection box to return to letter starting position for a further attempt at proper tracing by the learner.

3,662,078
SELF TEACHING MACHINE

William Holiday, La Mirada, Calif., assignor to Mattel, Inc.

Filed Sept. 11, 1969, Ser. No. 857,016
Int. Cl. G09b *7/06*
U.S. Cl. 35—9 A 7 Claims



A self teaching machine wherein means are provided for recording and presenting a sequence of problems one at a time to a student. A prepared answer sheet has a plurality of answers for each question with the correct answer to each of the questions being associated with conductive areas. The wrong answers are associated with non-conductive areas that appear visually identical, that is, the conductivity or non-con-

ductivity of the associated areas is not discernable to the human eye. A student is provided with a probe means which is connected to a control means for advancing the recording and presenting means to ask another question and stopping the recording and presenting means when the question has been asked. The recording and presenting means is advanced to the next question when the student touches the probe means to a conductive area corresponding to a correct answer thereby completing a circuit in the advancing means.

3,662,079

TEACHING AID FOR AUDIBLY AND VISUALLY ILLUSTRATING THE NOTES OF THE STAFF

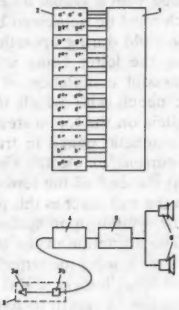
Hansrichard Schulz; Joachim Bulow; Berthold Schmitt, and Rudolf Schneider, all of Villingen, Germany, assignors to Firma Saba Schwarawalder Apparatebauanstalt August Schwer Sohne G.m.b.H., Villingen, Germany

Filed Nov. 20, 1970, Ser. No. 91,248

Claims priority, application Germany, Nov. 26, 1969, P 19 59 309.0

Int. Cl. G09b *15/00*

U.S. Cl. 84—471 **21 Claims**



A blackboard, having one or more staffs and the notes thereof on its front face, has on its rear face a series of electric conductors aligned with the respective notes on the front face, each conductor being connected to an audio oscillator for producing the frequency of the corresponding note. The output of the capacitive pickup head, when the latter is placed on a note, is conducted to a low amplitude suppressor and afterwards to an amplifier, which latter is connected to a loudspeaker. The low amplitude suppressor insures that the tone of an audio oscillator is audibly reproduced, without swelling or dying away, only when the pickup head is very close to a note.

3,662,080

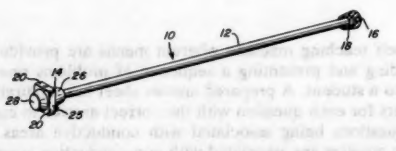
TWIRLING BATON

John F. Hale, 3729 Greenbay Drive, Dayton, Ohio, and Frederick J. Miller, 2150 E. Rahn Rd., Dayton, Ohio

Filed July 24, 1970, Ser. No. 58,117

Int. Cl. G09b *15/02*

U.S. Cl. 84—477 B **6 Claims**



A twirling baton includes a resilient ball having an enlarged non-circular portion with at least two side surfaces formed thereon for preventing the baton from rolling away from the twirler after it has been dropped. In the preferred embodiment, the enlarged portion has a cross-section in the form of a square and provides four planar side surfaces which contact the ground and quickly bring the baton to rest.

3,662,081

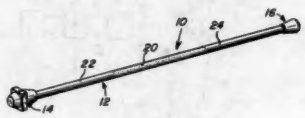
TWIRLING BATON WITH SPOTTING MEANS

John F. Hale, 3729 Greenbay Drive, Dayton, Ohio, and Frederick J. Miller, 2150 E. Rahn Rd., Dayton, Ohio

Filed July 24, 1970, Ser. No. 58,116

Int. Cl. G09b *15/02*

U.S. Cl. 84—477 B **1 Claim**



A twirling baton includes a shaft having means defining a textured area preferably on a central portion thereof for aiding the twirler to spot and follow a spinning baton against a bright background and for providing a surface for improved baton manipulation and control. In the preferred embodiment, the shaft is chrome-coated tubular stainless steel and the textured area is a sandblasted surface.

3,662,082

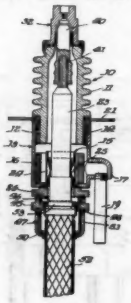
HIGH VOLTAGE CABLE TERMINATING ASSEMBLY

Donald R. Heppner, Chicago, Ill., assignor to G & W Electric Specialty Company, Blue Island, Ill.

Continuation-in-part of application Ser. No. 887,820, Dec. 24, 1969, now abandoned. This application Sept. 3, 1970, Ser. No. 69,334

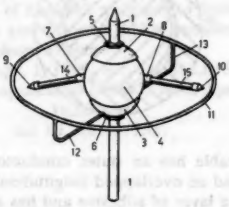
Int. Cl. H02g *15/22;* **H01b** *17/30*

U.S. Cl. 174—18 **10 Claims**



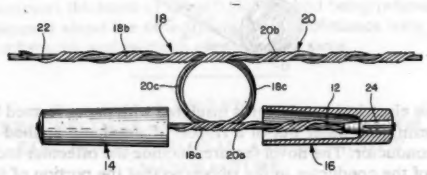
There is disclosed a factory assembled slip-on type of cable terminator in combination with electrical equipment comprising a cylindrical shell of insulating material, a dielectric media contained within the electric equipment and surrounding the insulating material of the cylindrical shell and a self-energizing resilient contact spring member within the cylindrical shell for improving the mechanical and electrical connections for current transfer. In addition, the self-energizing resilient contact spring member, together with other elements of the assembly, permits easy insertion of the cable connector although preventing accidental cable pull-out or cable blow-out under fault current conditions.

3,662,083
LIGHTNING CONDUCTOR
Rene Constant, Mol-Donk, Belgium, assignor to Centre d'Etude de l'Energie Nucleaire en abrege "C.E.N.,", Brussels, Belgium
Filed Apr. 14, 1970, Ser. No. 28,423
Claims priority, application Belgium, Apr. 15, 1969, 72,768
Int. Cl. H02g 13/00
U.S. Cl. 174—4 C 14 Claims



Lightning rods having around the rod at least one radioactive ionizing source comprising a chemically-inert gas such as Kr–85 whereby efficient lightning protection is insured and at the same time the danger present with solid radioactive material is eliminated.

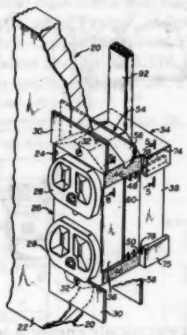
3,662,084
VIBRATION DAMPER
Clarence E. Smrekar, Cleveland, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio
Filed Aug. 13, 1971, Ser. No. 171,697
Int. Cl. H02g 7/14
U.S. Cl. 174—42 8 Claims



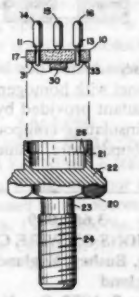
There is disclosed a vibration damper for an electrical transmission line or the like comprising a pair of weights supported at opposite ends of a rod and a pair of helically preformed dead-end appliances each having a pair of helical leg portions and an intermediate bight portion. One leg portion of each appliance is wrapped about the transmission line and the other leg of each appliance is wrapped about the rod, the appliances being applied so as to face in opposite directions with their respective bight portions overlapping to form a central loop.

3,662,085
MOUNTING BRACKET FOR SWITCH OR RECEPTACLE
Daniel E. Robinson, Metuchen, and Solomon Rubinstein, Fanwood, both of N.J., assignors to General Cable Corporation, New York, N.Y.
Filed Mar. 12, 1971, Ser. No. 123,715
Int. Cl. H02g 3/18
U.S. Cl. 174—48 10 Claims

This electrical fitting, such as a wall outlet or a switch, has a housing that extends through an opening in a wall and has flange means that extend beyond the sides of the opening across the front of the wall to prevent the housing from being pushed through the opening. A bracket fits around the housing and is adjustable along the housing from front to back; and the bracket has a flange that contacts with a back surface of the wall. Complimentary locking means on confronting surfaces of the housing and the bracket selectively engage with one another at different positions of the bracket or accommodating the bracket to walls of different thickness.



3,662,086
SEMICONDUCTOR PACKAGE
Philip S. Hessinger, W. Caldwell, N.J., assignor to National Beryllia Corp., Haskell, N.J.
Filed May 25, 1970, Ser. No. 40,286
Int. Cl. H05k 5/04
U.S. Cl. 174—52 S 5 Claims

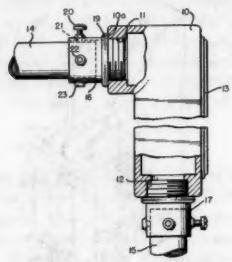


A ceramic disk for sealing the chamber built onto a metal stud acting as a heat sink, is provided with a surface that will be the interior surface when sealed, which acts as the substrate for the semiconductor or electronic circuit. The circuit on said disk can be completed and tested before it is sealed onto the stud.

3,662,087
UNIVERSAL CONDUIT CONNECTOR
Lloyd G. Singletary, 925 Lilley Ave., Columbus, Ohio
Filed Nov. 17, 1970, Ser. No. 90,395
Int. Cl. H02g 3/18
U.S. Cl. 174—65 R 4 Claims

A hollow tubular conduit connector is provided with external threads at one end for thread engaging a conduit fitting, and with an outstanding flange portion for surface engaging the fitting. The connector is also provided with a plurality of like-dimensioned threaded holes extending therethrough and disposed in a circular locus about the connector; and a

removable set screw interchangeable between said threaded holes extends through a selected one of said holes to



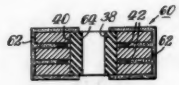
mechanically and electrically engage a section of conduit inserted into the connector.

3,662,088

ELECTOSTATICALLY COATED LAMINATED BUS BAR ASSEMBLY

George E. Wright, Barrington, and Leonard F. Wisniowicz, Wheaton, both of Ill., assignors to Methode Manufacturing Corp., Rolling Meadows, Ill.

Filed Jan. 20, 1970, Ser. No. 4,244
Int. Cl. H02g *5/00*
U.S. Cl. 174—72 B **1 Claim**



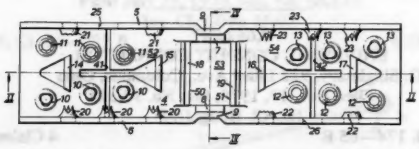
A multilayer, multiconductor bus bar or multilayer, multiconductor wiring panel with homogeneous insulation, bonding agent and encapsulant provided by simultaneous deposition of microscopic insulating compound to the electrically charged and heated conductors, —and method of manufacture.

3,662,089

MODIFICATIONS OF WIRE CONNECTORS

John Patrick Harding, Bushey, England, assignor to The Post Office, London, England

Filed Nov. 9, 1970, Ser. No. 87,715
Claims priority, application Great Britain, Nov. 15, 1969, 55,677/69
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 C **6 Claims**



A clip for use in jointing wires particularly of multi-wire cables the clip being trough like in form of having tangs in its sidewalls in addition to wire engaging means in its base.

3,662,090

COAXIAL CABLE

William L. Grey, Hartsdale, N.Y., assignor to Anaconda Wire and Cable Company

Filed Apr. 16, 1971, Ser. No. 134,560
Int. Cl. H01b *11/18*
U.S. Cl. 174—107 **10 Claims**

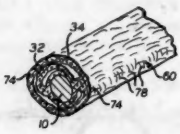
A coaxial cable has an outer conductor bonded to the cable jacket and an overlapped longitudinal seam. The seam is sealed with a layer of adhesive and has a bare stripe, free from adhesive, to allow metal-to-metal electric contact.

3,662,091

ELECTRICAL CONDUCTOR WITH PAPER INSULATION

Ludwik Jachimowicz, Elizabeth; Edwin W. Reasoner, Morristown, and Jerzy A. Olszewski, Edison, all of N.J., assignors to General Cable Corporation, New York, N.Y.

Original application May 16, 1968, Ser. No. 729,600, now Patent No. 3,597,311, dated Aug. 3, 1971. Divided and this application Mar. 29, 1971, Ser. No. 128,763
Int. Cl. H01b *7/02*
U.S. Cl. 174—110 P **8 Claims**



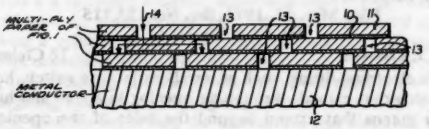
This electrical conductor is insulated with paper formed by squeezing the water out of a ribbon of woodpulp applied to the conductor. The novel features include the offcenter location of the conductor in the ribbon so that the portion of the ribbon extending from one side of the conductor is long enough to wrap all the way around the conductor and over itself in a lap seam. A stream of water is applied to one surface of the paper to refloat some of the fibers that are in position to extend across the seam to lock the seam closed when the ribbon is wrapped around the conductor.

3,662,092

CABLE INSULATED WITH PAPER

Pasini Franco, Milan, Italy, assignor to Industrie Pirelli S. P. A., Milan, Italy

Original application Mar. 8, 1968, Ser. No. 711,582, now Patent No. 3,598,691. Divided and this application Sept. 17, 1970, Ser. No. 73,243
Int. Cl. H01b *7/02*
U.S. Cl. 174—120 FP **13 Claims**



Paper tape for insulating high tension cables is produced with a multi-layer construction. A low density core layer is

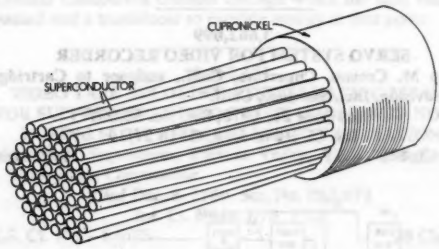
faced on one or both sides with thin high impermeability layers. The dielectric strength is a function of the latter while the impregnability and loss factor is a function of the former.

3,662,093

SUPERCONDUCTING ELECTRICAL CONDUCTORS

Martin Norman Wilson, Abingdon; Peter Faraday Smith, Newbury; Colin Russell Walters, Abingdon; John David Lewin, Oxford; Robert Walter Broomfield, Streetley, Sutton Coldfield, and Robert Leslie Graham, Four Oaks, Sutton Coldfield, all of England, assignors to Science Research Council, London and Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Apr. 1, 1969, Ser. No. 812,015
Claims priority, application Great Britain, Apr. 3, 1968, 16,023/68
Int. Cl. H01u *11/00*
U.S. Cl. 174—128 **17 Claims**



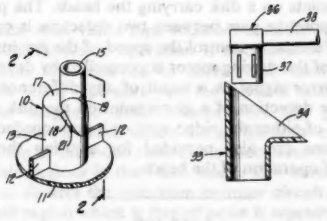
An electrical conductor comprising filaments of superconductor in a non-superconductor matrix, each filament having a maximum thickness of about 0.005 cm and being twisted or transposed about the other filaments in accordance with the given formula, and methods of making the same.

3,662,094

HEAT RECOVERABLE INSULATING COVER FOR ELECTRICAL TERMINAL, AND METHOD OF MANUFACTURE

Judson Douglas Wetmore, San Mateo, and Donald R. Allan, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed July 6, 1970, Ser. No. 52,523
Int. Cl. H01b *17/00*
U.S. Cl. 174—138 F **6 Claims**



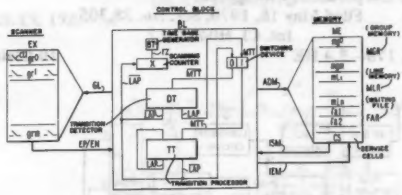
Heat-shrinkable plastic material is molded, expanded, laterally distorted and cooled to provide an insulating cover for a flag-type electrical terminal assembly having right-angle components. The cover when positioned to enclose such terminal assembly and when heated changes its shape to envelop the terminal assembly in close-fitting relationship.

3,662,095

A TELEGRAPH SIGNAL RECEIVING ARRANGEMENT FOR PERFORMING DETECTION AND PROCESSING OF SIGNALS ON INCOMING TELEGRAPH LINES

Henri Benmussa, Meudon; Ngoc-Sanh Bui, Hay-les-Roses, and Gerard Troubac, Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of application Ser. No. 810,276, Mar. 25, 1969, now abandoned. This application Nov. 30, 1970, Ser. No. 93,910
Claims priority, application France, Mar. 28, 1968, 145858
Int. Cl. H04l *7/16*
U.S. Cl. 178—3 **8 Claims**



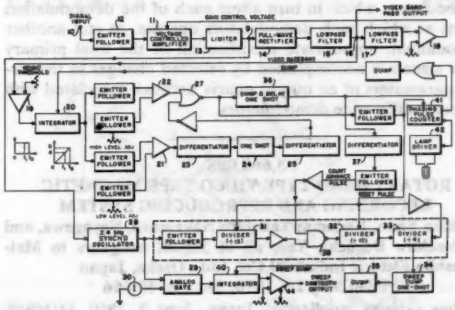
The invention concerns improvements to telegraph character receiving systems in which a control block is designed to perform both the transition or change detecting operation on a plurality of lines and the transition processing operation. The control block will initially be switched into the transition detecting operation wherein it scans the lines to detect transitions, upon detection of at least one transition, a switching circuit operates and switches the control block into the transition processing operation wherein it operates to reconstitute the characters whereto each transition belongs. When the processing of the transition is completed, the switching circuit operates anew and again switches the control block into the transition detection operation. The alternate operating process enables the use, for transition processing operations, of a large proportion of the circuits used for the transition detecting operations, and thereby economical utilization of the equipment.

3,662,096

ELECTRONIC PHASING AND SYNCHRONIZING CIRCUIT FOR FACSIMILE RECORDERS

Scott D. Morton, Reseda, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 8, 1970, Ser. No. 53,046
Int. Cl. H04n *1/36*
U.S. Cl. 178—7.3 S **1 Claim**



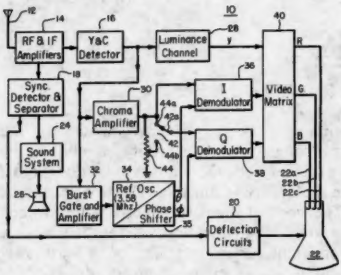
In a facsimile recording system for recording facsimile video signals, apparatus for detecting a phasing bar received at the beginning of each line of said facsimile video signals. Modulated carrier facsimile video signals are demodulated. A

magnitude detector senses the magnitude of the demodulated facsimile video signals and produces an output when the magnitude of the demodulated signals substantially equals the known magnitude of the phasing bar. A bar width detector functions in response to the output of the magnitude detector to produce an output when the pulse width of the demodulated signals substantially equals the known pulse width of the phasing bar.

3,662,097
CHROMA PROCESSING CIRCUITRY WITH SELECTABLE COLOR CORRECTION MODE

John L. Rennick, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 18, 1970, Ser. No. 38,305
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 HE **10 Claims**



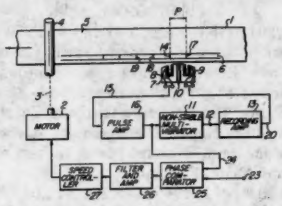
Chroma processing circuitry for a color television receiver wherein nominally derived primary color signals in accordance with extracted reference information in a first selectable mode of operation may be suitably modified in a second selectable mode of operation to minimize the effect of any phase errors otherwise readily discernible as undesirable departures in fleshtone hues. The referenced modification comprises a predetermined reduction in green-purple color information relative to derived luminance and orange-cyan information. Three embodiments are disclosed. In one such embodiment employing I and Q demodulation techniques, the chroma signal as applied to the input of the included Q demodulator is selectively reduced by associated control circuitry; the signal information along the Q axis or demodulation angle representing essentially green-purple color information. In another embodiment, employing convention (R–Y) and (B–Y) color difference demodulators, the desired reduction in green-purple information is provided by suitable alteration of the respective phase delays effected in components of the reference signal selectively applied to the demodulators which in turn alters each of the demodulation angles at which such demodulators operate. In still another embodiment, appropriate modification of the final primary color signals is accomplished by selected changes in the circuit parameters of an output matrix network associated with the color difference demodulators.

3,662,098
ROTARY HEAD-TYPE VIDEO TAPE MAGNETIC RECORDING AND REPRODUCING SYSTEM

Osahiko Yano, Kadoma; Takahiro Nakamura, Neyagawa, and Masahiro Deguchi, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1970, Ser. No. 40,666
Claims priority, application Japan, June 3, 1969, 44/44948; July 2, 1969, 44/53636
Int. Cl. G11b *5/26, 15/52;* H04n *5/78*
U.S. Cl. 178—6.6 P **2 Claims**

A rotary head-type video tape magnetic recording and reproducing system in which, at the time of recording, pulse signals are not only recorded on a running magnetic tape but are regenerated and a tape driving system is controlled in such a manner that the regenerated signals maintain a fixed phase relation with a reference signal; and in which, at the

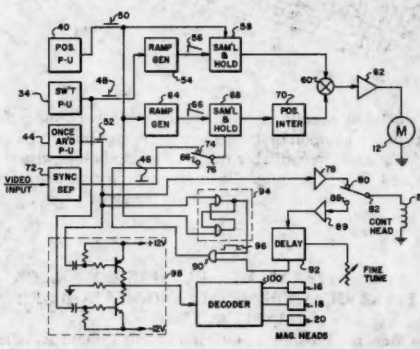


time of reproduction, said pulse signals are regenerated and the tape driving system is so controlled that the regenerated signals and a reference signal maintain a fixed relation between each other, thus facilitating the compiling and recording operation of the magnetic tape.

3,662,099
SERVO SYSTEM FOR VIDEO RECORDER

Philip M. Crosno, Cupertino, Calif., assignor to Cartridge Television, Inc., San Jose, Calif.

Filed June 26, 1970, Ser. No. 50,061
Int. Cl. H04n *5/78;* G11b *21/10*
U.S. Cl. 178—6.6 P **10 Claims**



A video recorder has multiple rotating heads, the speed and phase of rotation of which must be accurately synchronized with the transmitted video signal or with a prerecorded control signal. This is accomplished by means of a servo which utilizes two fixedly positioned pick-up devices adjacent the rotating heads for detecting the passing of certain fixed points on a disk carrying the heads. The period of time for a point to pass between two detectors is compared with the reference to control the speed of the driving motor. The phase of the driving motor is controlled by developing a positional error signal as a result of any difference in time between the detection of a given point on the disk with the occurrence of either the video sync or a prerecorded control signal. Means are also provided for assuring the proper sequence of operation of the heads.

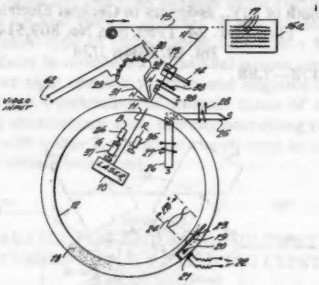
3,662,100
LASER TAPE RECORDING

R. Lee Hollingsworth, 110 Fox Boulevard, Massapequa, N.Y.

Continuation-in-part of application Ser. No. 396,842, Sept. 16, 1964. This application May 9, 1967, Ser. No. 637,157
Int. Cl. G03g *19/00*
U.S. Cl. 178—6.6 **14 Claims**

This is a tape recording system wherein the intelligence is supplied to the tape by means of a laser beam and involves

means to direct and modulate the laser beam. The modulating means include the use of an electromagnetic reed, the



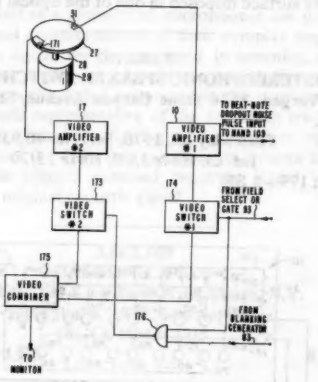
circulation of magnetic dust particles around a continuous circular transparent channel through which the light beam is passed and a transducer to provide energy at that point.

3,662,101

VIDEO TAPE RECORDER SYSTEM HAVING MEANS FOR SUPPRESSING VIDEO TRACK CROSSOVER NOISE DURING SLOW AND FAST MOTION OPERATION

Richard J. Segerstrom, Portola Valley, Calif., assignor to Video Logic Corporation

Filed Dec. 8, 1969, Ser. No. 882,971
Int. Cl. H04n *5/78, 7/12*
U.S. Cl. 178—6.6 FS **28 Claims**



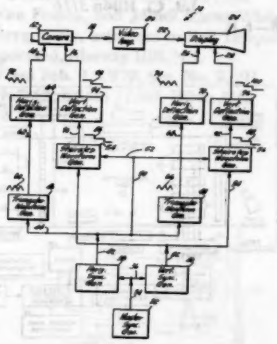
A helical scan video tape recorder suitable for slow and fast motion modes of operation is disclosed. A plurality of video fields are recorded in each video track extending across the video tape such that the burst of noise produced when the magnetic head crosses over the guard band between separate video tracks during the slow or fast mode of operation of the video recorder is encountered in only one of the field regions in the video track. This burst of noise is utilized to control the television monitor circuit so that the video field region which is free of noise is reproduced on the monitor while the video field region which contains the noise is blanked out from the monitor. As the noise progresses from one field region to the succeeding field region in the video track, means is provided for automatically switching to display of the noise-free field region. Means is provided for at times controlling the brightness of the monitor to compensate for those instances at switchover where two fields are reproduced in succession without the intervening blank period. A ramp generator circuit is provided for compensating for the change in timing of the vertical sync pulses during the slow and fast motion periods. In another embodiment, an additional magnetic head is utilized for reproducing the noise-free video field during the time period that the monitor would ordinarily be blanked out to thereby provide a 100 percent duty cycle in the video monitor.

3,662,102

BI-DIRECTIONAL TELEVISION SCAN SYSTEM

John W. Herndon, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 15, 1970, Ser. No. 72,290
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.7 **1 Claim**



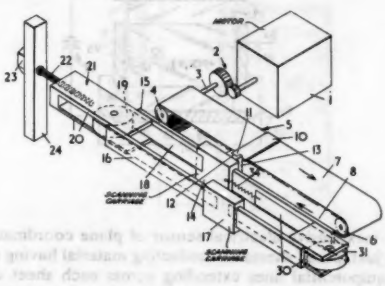
A television scansion system generates symmetrical triangular waveform horizontal deflection signals and linear ramp stairstep vertical deflection signals. The raster produced by these deflection signals is characterized as bi-directional horizontal scanning with vertical steps at alternate ends of the scans.

3,662,103

FACSIMILE APPARATUS

John Stanley Willmer, Chaldon, and Francis Maurus Anderson, Beckenham, both of England, assignors to Muirhead Limited, Beckenham, Kent, England

Filed Aug. 5, 1969, Ser. No. 847,602
Claims priority, application Great Britain, Sept. 20, 1968, 44,843/68
Int. Cl. H04n *1/14*
U.S. Cl: 178—7.6 **7 Claims**



Facsimile scanning apparatus is provided with two carriages which move in antiphase with one another along parallel rails and respectively scan alternate lines. The two car-

riages are interconnected by a tensioned inextensible loop passing around a pulley at one end of the rails. The pulley is movable towards and away from the rails so that the phase relationship of the carriages may be adjusted while the apparatus is in use, thus ensuring that the desired 180° antiphase relationship necessary for good facsimile reproduction can be attained quickly and easily.

3,662,104

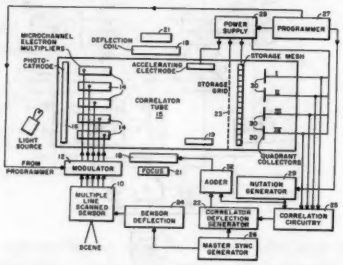
ELECTRONIC AREA CORRELATOR WITH MULTIPLE INPUT SIGNALS

Marvin P. Nordseth, Corona, and Werner G. Hueber, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 614,530, Feb. 1, 1967, now abandoned. This application Apr. 25, 1968, Ser. No. 725,270

Int. Cl. H04n *3/16*

U.S. Cl. 178—6.8 **4 Claims**



A closed loop electronic area correlation tracker consisting of an electronic image storage tube with microchannel electron multipliers as input devices to allow use of a multiplicity of simultaneous input signals supplied from a matrix type input sensor and the like.

3,662,105

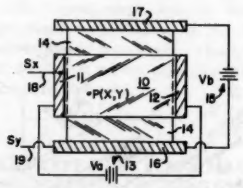
ELECTRICAL SENSOR OF PLANE COORDINATES

George S. Hurst, and James E. Parks, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed May 21, 1970, Ser. No. 39,353

Int. Cl. H04n *1/00*

U.S. Cl. 178—18 **13 Claims**



An inexpensive electrical sensor of plane coordinates employs juxtaposed sheets of conducting material having electrical equipotential lines extending across each sheet and arranged normal to each other. A probe upon touching each sheet at a selected intersection of the equipotential lines causes separate signals to be applied to one or more conventional information-indicating units.

3,662,106

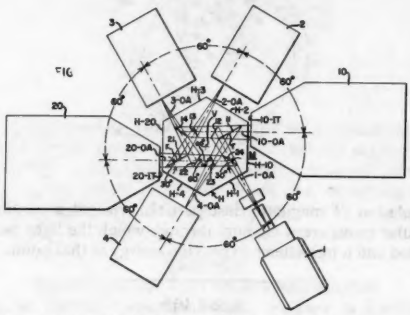
OPTICAL MULTIPLEXING DEVICE AND SYSTEM FOR TELEVISION TRANSMITTERS

Dale F. Buller, Liverpool, and Douglas W. Rohrs, Baldwinsville, both of N.Y., assignors to General Electric Company

Filed Mar. 24, 1969, Ser. No. 809,514

Int. Cl. H04n *5/24*

U.S. Cl. 178—7.88 **11 Claims**



A device and system for establishing two alternative optical paths between each of four image sources and two discrete color television cameras. This system provides eight identical optical path lengths. It also includes a multiplexing device which comprises a hexagonally configured housing wherein there are arranged eight slidably movable mirrors. Each of these mirrors is of the first surface type, having a reflective surface disposed in one of the optical paths.

3,662,107

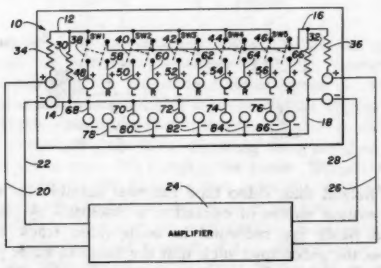
MULTISTEREOPHONIC SPEAKER SWITCHING DEVICE

Harry Vorgan, 3676 Stone Canyon Avenue, Sherman Oaks, Calif.

Filed May 25, 1970, Ser. No. 40,939

Int. Cl. H04r *5/00;* **H01r** *13/70*

U.S. Cl. 179—1 SW **7 Claims**



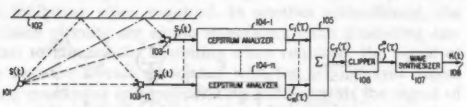
Main left and right speaker positive and negative input circuits connectable to a stereophonic unit amplifier circuit are connected in the device through a series of switches to a series of sets of left and right speaker positive and negative output circuits, each set of left and right speaker positive and negative output circuits being connectable to a set of left and right speakers. Each of the switches is of double pole type so that actuation of one switch simultaneously connects one of the sets of left and right speaker positive and negative output circuits to the main left and right speaker positive and negative input circuits permitting the connection of a given

number of left and right speaker sets into the stereophonic amplifier circuit. A low resistance resistor is connected in series into at least one of the positive and negative input circuits of the main left and right speaker input circuits to provide a load for and prevent damage to the transistors of a transistor circuit type of stereophonic unit, and a higher resistance resistor is connected in parallel across each of the main left and right speaker positive and negative input circuits to prevent overloading of vacuum tubes of a vacuum tube type of stereophonic unit, thereby permitting the device to be used with either a transistor circuit type or a vacuum tube type of stereophonic unit.

3,662,108
APPARATUS FOR REDUCING MULTIPATH DISTORTION OF SIGNALS UTILIZING CEPSTRUM TECHNIQUE

James Loton Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 8, 1970, Ser. No. 44,269
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 SA **11 Claims**

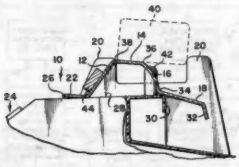


Distortion of an acoustic signal caused by multipath transmission is minimized by utilizing a cepstrum technique. Signals received at a plurality of microphones are processed to obtain signal representations of their complex cepstrums. The cepstrum signals are then summed. In summing, the portions of the cepstrum signals representative of the undistorted acoustic signal cohere while the portions of the cepstrum signals representative of the multipath transmitted signals do not. Selective clipping of the summed cepstrum signal eliminates the distortion components. Inverse transformation of the clipped summed cepstrum signal yields a replica of the original acoustic signal.

3,662,109
HANDSET LIFTER

Mark A. Beathan, 344 King Road West, Ithaca, N.Y.

Filed Jan. 6, 1970, Ser. No. 941
Int. Cl. H04m *1/08*
U.S. Cl. 179—1 HS **8 Claims**

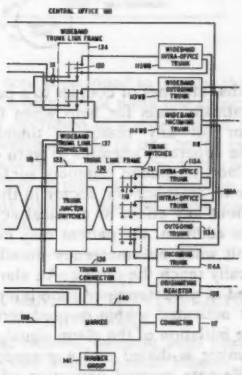


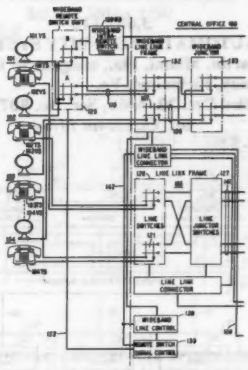
A telephone accessory for raising the handset of a desk type telephone from an initial rest position on the cradle means of the telephone base toward an elevated position in which the handset is supported at a height sufficient to permit the switch operating plunger means to extend from the telephone base to electrically connect the telephone instrument for dialing and transmission and reception. The invention is characterized in that the accessory comprises a unitary body member that is formed of sheet material and includes cam and supporting planes. The accessory is rearwardly displaceable, when the handset is in the initial rest position, from an initial forward position relative to the handset toward a rearward position in which the cam plane operates to raise the handset to the aforementioned elevated position. The handset may then be completely removed from the cradle, and upon subsequent replacement of the handset in an inclined position in the cradle, the handset will engage the cam plane to automatically slide the accessory to the forward position, thereby permitting the handset to depress the switch plungers to an open circuit condition.

3,662,110
COMBINED WIDEBAND NARROWBAND COMMUNICATION SYSTEM

Marvin Dale Van Fossen, and James Glenn Whitemyer, both of Reynoldsberg, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1970, Ser. No. 9,691
Int. Cl. H04m *11/00;* **H04q** *3/42*
U.S. Cl. 179—2 TV **16 Claims**





A communication system is disclosed for voice transmission and wideband transmission such as video telephone ser-

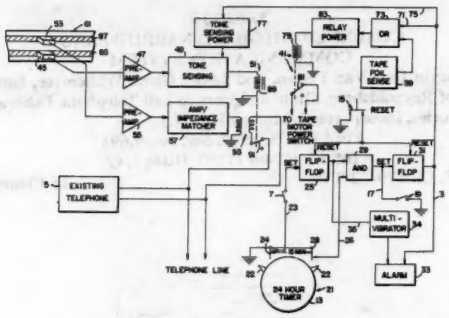
vice. The central switching office is equipped with separate voiceband and wideband switching networks which can be controlled independently by the same common equipment.

3,662,111

AUTOMATIC TELEPHONE CARE DEVICE

Morton K. Rubinstein, Los Angeles, Calif., assignor to Morton K. Rubinstein, Los Angeles and Herbert J. Rubinstein, Los Gatos, Calif.

Filed Aug. 13, 1970, Ser. No. 63,434
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P **9 Claims**



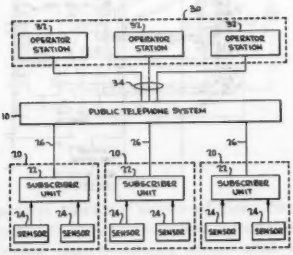
Apparatus that attaches or couples to a patient's telephone which automatically calls for help when the patient is incapacitated or for any reason is unable to reach his telephone. The apparatus attempts to warn or advise persons at predetermined telephone numbers such as the patient's relatives, friends, neighbors or doctor in the event of his incapacity, without any effort or physical acts on the part of the patient. In addition, the patient may manually remotely trigger the unit when an emergency situation arises and he cannot physically reach the device. An alarm signal is cyclically generated at predetermined time intervals. If a manual switch is not activated within a predetermined time subsequent to the initiation of the alarm signal, a predetermined telephone number is dialed and a prerecorded message is transmitted. Remote manual activation of the dialing and message is also provided.

3,662,112

AUTOMATIC SECURITY SYSTEM

Stephen J. Martin, Miami, Fla., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 22, 1969, Ser. No. 887,250
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P **36 Claims**



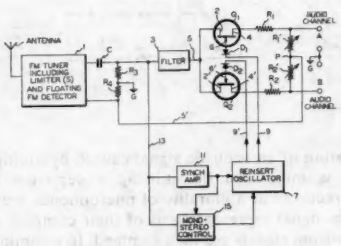
An automatic security system for use with public telephone facilities to centrally monitor various alarm events occurring at any one of a plurality of remote locations. The system includes a central monitoring complex having a number of operator stations connected to a local public telephone exchange, and a plurality of subscriber unit circuits, one for each remote location to be monitored, also coupled to public telephone exchange apparatus by conventional telephone lines. A number of sensing devices at each remote location operate in response to various alarm conditions to energize the subscriber unit causing automatic dialing of the central complex whereupon one of the operator stations will receive the call. The system includes solid-state circuitry for enabling effective operator station control of the various functions of the subscriber unit during an emergency by utilizing timed command tone signals.

3,662,113

STEREOPHONIC DEMODULATOR APPARATUS AND AUTOMATIC MONOPHONIC-STEREOPHONIC SWITCHING CIRCUIT

Daniel R. Von Recklinghausen, Arlington, Mass., assignor to H. H. Scott, Inc., Maynard, Mass.

Filed Mar. 27, 1968, Ser. No. 716,449
Int. Cl. H04h *5/00*
U.S. Cl. 179—15 BT **10 Claims**



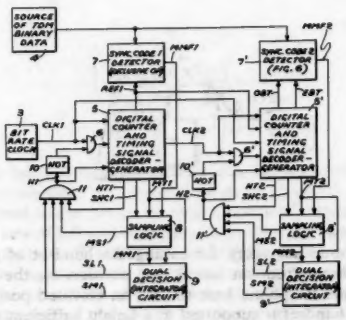
This disclosure deals with stereophonic demodulator apparatus using field effect transistors that eliminate the need for critically balanced bridge detector elements and additionally serve automatically as monophonic-stereophonic transientless switching circuits.

3,662,114

FRAME SYNCHRONIZATION SYSTEM

James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 13, 1970, Ser. No. 36,744
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS **7 Claims**


SOURCE OF TDM BINARY DATA
SYNC CODE 1 DETECTOR (EXCLUSIVE OR)
SYNC CODE 2 DETECTOR (FIG. 6)
BIT RATE CLOCK
DIGITAL COUNTER AND TIMING SIGNAL DECODER-GENERATOR
DIGITAL COUNTER AND TIMING SIGNAL DECODER-GENERATOR
SAMPLING LOG/C
SAMPLING LOG/C
DUAL DECISION INTEGRATING CIRCUIT
DUAL DECISION INTEGRATING CIRCUIT

Frame synchronization for a binary data signal having a multi-frame including N frames, each of the frames including

M channels and a first sync signal, at least one of the channel signals including in each of the frames a different one of (N-1) subchannel signals and a second sync signal is accomplished by employing two sync signal detectors, one being responsive to the first sync signal and a first predetermined local timing signal therefor to provide a first control signal indicative of the phase relation between these two signals and the other being responsive to the second sync signal and a second predetermined local timing signal therefor to provide a second control signal indicative to the phase relation between these two signals. The two control signals are samples by two different sampling circuits. The outputs of the sampling circuits are applied to two different decision circuits whose outputs control the timing of two cascade connected digital counters and timing signal generators used to generate necessary timing signals including the two predetermined local timing signals. The first digital counter and generator is driven by a bit rate clock which is inhibited when the decision circuit associated therewith indicates an out-of-sync condition. The second digital counter and generator is driven by a frame rate clock from the first counter and generator which is inhibited when the decision circuit associated therewith indicates an out-of-sync condition. In one embodiment, the decision circuits are dual integrators each generating two signals to separately control the inhibiting when required. In another embodiment, the decision circuits are single integrators each producing one signal to control the inhibiting when required, the signal of the decision circuit associated with the second sync signal being connected in a cooperating manner with the signal of the decision circuit associated with the first sync signal to control the inhibiting of the bit rate clock.

3,662,115

AUDIO RESPONSE APPARATUS USING PARTIAL AUTOCORRELATION TECHNIQUES

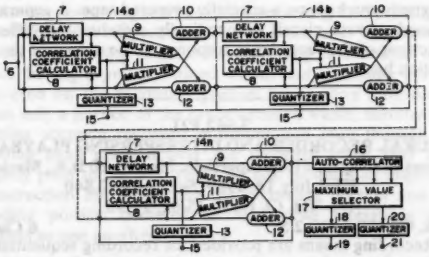
Shuzo Saito; Fumitada Itakura; Masaaki Nishikawa, and Tsunehiko Koike, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 9, 1970, Ser. No. 79,430

Claims priority, application Japan, Feb. 7, 1970, 45/10992; 45/10993

Int. Cl. C10l *1/00*; H04m *11/00*

U.S. Cl. 179—15 A **6 Claims**



The audio response apparatus comprises means for storing speech parameters including partial autocorrelation coefficients between two closely adjacent time instants of speech signal, which are derived by removing the redundant components from the actual speech signal levels of the two adjacent instants in consideration of the effect of intermediate sample levels between them and an excitation source information determined from sampled values at remotely spaced time instants, a memory to store the speech parameters, read out means to read out the speech parameters from the memory which are designated by an electronic computer, and a speech synthesizer to reconstruct the speech signal from the output of the readout means. The synthesizer is comprised by high speed logic elements and operates to synthesize multichannel audio outputs on the time division basis.

3,662,116

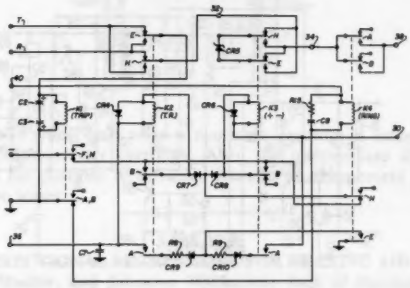
SUBSCRIBER SUPERIMPOSED SIGNALING UNIT

John Philip Wittman, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,603

Int. Cl. H04m *3/56*

U.S. Cl. 179—17 E **5 Claims**



Ringing control tone is provided to operate the ringing circuit of any one of a plurality of party line subscribers. Ringing depends upon operation of control relays which direct signals with a superimposed dc of one or the other polarity on the tip or ring side of the called subscriber's line. The control relays are locked in position on operation of the relay which provides ring tone. In this way "bell tap," or "cross ringing," is prevented.

3,662,117

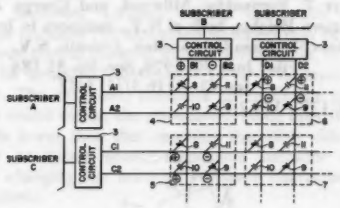
CROSSTALK MINIMIZATION IN MULTI-WIRE NETWORKS

Jayantkumar Bhatt, Ottawa, Ontario; John George Mlacak, Kanata, Ontario, and Thomas Arthur Winlow, Ottawa, Ontario, all of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Dec. 3, 1970, Ser. No. 94,800

Int. Cl. H04q *3/50*

U.S. Cl. 179—18 GF **5 Claims**

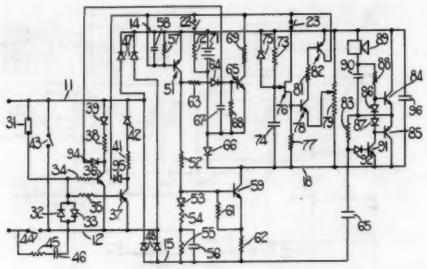


The crosstalk in a two-wire network is minimized by cancelling the crosstalk signal at every crosspoint. This is achieved by providing each crosspoint of a two-wire network with a pair of capacitive elements each having substantially the same capacitance as that of a non-actuated switch used for the crosspoint. These elements are connected at the pair of intersections of the horizontal and vertical conductors of the crosspoint other than those at which the switches are connected.

3,662,118
CIRCUITRY MEANS TO ENABLE THE AUTOMATIC DIALLING OF TELEPHONE NUMBERS WITHOUT LIFTING THE HANDSET

Lancelot Phoenix, Birmingham, and Joseph David Foulkes Taylor, Eardiston, near Tenbury Wells, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 8, 1970, Ser. No. 26,735
Claims priority, application Great Britain, May 15, 1969, 24,746/69
Int. Cl. H04m *1/26*
U.S. Cl. 179—90 B **3 Claims**

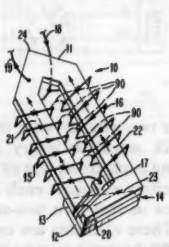


Automatic Telephone Dialling Apparatus of the kind having a handset and switch means operable manually to dial automatically a pre-selected telephone address. The Apparatus includes a pair of DC supply lines and a rectifier coupling the DC supply lines to the telephone lines to provide power to the DC supply lines. A trigger circuit is connected between the DC supply lines and controls the supply of power thereto. An amplifier and an associated loudspeaker are connected between the DC supply lines and are coupled to the telephone lines, so that when the trigger circuit is operative the loudspeaker will produce an audible amplified version of the signals on the telephone lines. There is provided means operable when the switch means is operated to dial a selected telephone address for driving the trigger circuit to its operative state, and inserting across the telephone lines an impedance which simulates lifting of the handset. Further means is provided for driving the circuit to its inoperative state when the handset is lifted the trigger circuit incorporating a battery for maintaining the trigger circuit in its operative state during dialling.

3,662,119
THIN FILM MAGNETIC TRANSDUCER HEAD

Lubomyr T. Romankiw, Milwood, and George A. Wardly, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,186
Int. Cl. G11b *5/12, 5/42*
U.S. Cl. 179—100.2 C **9 Claims**

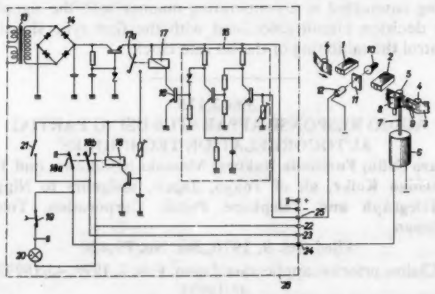


A rectangular thin film transducer head includes a magnetic core composed of overlapping laminations of permalloy film joined together magnetically and electrically, near an air gap, at one end of the rectangle, between the two laminations, which gap couples flux to the magnetic recording medium. Two electrically parallel insulated thin film copper windings starting at the end opposite the gap are deposited about the core joining electrically at the end adjacent to the gap to a conductor coupled to both permalloy laminations which conduct return current through the legs of the core inside of the windings. Alternatively, a single series winding passes around the core and through the gap. The head is manufactured by means of photolithographic, vacuum, and thin film techniques.

3,662,120
TAPE RECORDER USEFUL AS AN AUTOMATED TEACHING APPARATUS

Rene Hess, Avon, France, assignor to Compagnie internationale pour la diffusien de la culture europeenne, societe anonyme (Cidice), Fribourg, Canton of Fribourg, Switzerland

Filed June 3, 1969, Ser. No. 829,953
Claims priority, application Switzerland, June 13, 1968, 8777/68
Int. Cl. G11b *15/06*
U.S. Cl. 179—100.2 S **8 Claims**



In addition to having all of the conventional components, the tape recorder has a detection head for detecting non-magnetic markers on a specially prepared tape. A separately housed control circuit automatically switches the different functions of the recorder in response to the output of the detection head.

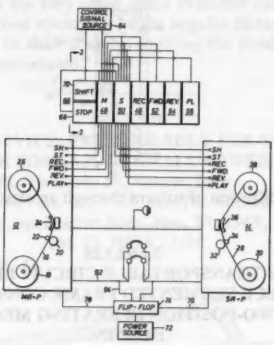
3,662,121
PLURAL RECORDER AND INTERSPERSING PLAYBACK

James P. Cruger, 41600 Apartado, Mexico, 10 D.F., Mexico

Filed July 18, 1969, Ser. No. 842,840
Int. Cl. G11b *15/02, 27/30*
U.S. Cl. 179—100.2 S **6 Claims**

Recording means are provided for recording sequentially a series of recordings, such as questions, on a first recording medium, then on playing it back, it will stop at the end of each recording of the series and while so stopped after each recording, a recording to be interposed thereafter on ultimate playback may be made on a second recording medium, thereby providing a second series of sequential recordings such as answers to the questions respectively, on the second medium, then for alternately playing the first series and interposing therebetween on ultimate playback, the respective recordings of the second series, providing a continuous sequential playback of alternate first and second recordings such as a sequential question and answer series playback. A special dual signal recording and stop control is provided whereby a stop of recording and playback may be effected and whereby at the end of each recording of each series a control signal recording is made on the same medium before

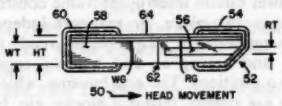
the stop control is effective. The playback has an automatic control whereby during playback upon encountering one of such recorded control signals, the playback will be interrupted and driving power shifted to the other recording medium. A single instead of a dual recording device may be employed for making the recording on each recording medium, even though the dual device is usually preferable.



3,662,122
WIDE-RECORD NARROW-READ LAMINATED MAGNETIC HEAD

Matthias J. Grundtner, St Paul, and George E. Melink, Burnsville, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,252
Int. Cl. G11b *5/16, 5/26*
U.S. Cl. 179—100.2 C **9 Claims**



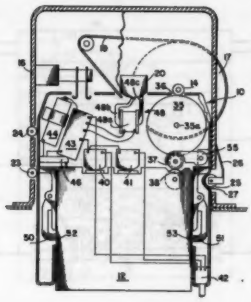
An improved magnetic head for recording and reading information on a magnetic medium is described. The head includes a recording portion for recording information on a track having a predetermined width, and a reading portion centered on the recording portion for reading information from only a portion of the predetermined width, thereby permitting accurate recovery of information even through the reading head position over the recorded track may shift slightly prior to reading. The head also includes an improved construction for supporting the recording portion and the reading portion centered to very close tolerances with respect to one another.

3,662,123
CARTRIDGE ADAPTOR

William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 18, 1970, Ser. No. 47,545
Int. Cl. G11b *5/00*
U.S. Cl. 179—100.2 Z **3 Claims**

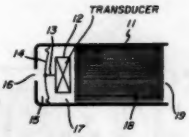
A converter cartridge is arranged to receive a two track cartridge of prerecorded tape and cause reproduction of the tape therein through an eight track stereo tape player. Drive means are provided within the converter cartridge to couple tape transport power from a capstan within the eight track stereo tape player to the drive wheel within the two track cartridge. The drive means includes a first drive wheel engaging the capstan and a pivotal idler drive wheel intermediate the first drive wheel and the two track cartridge to engage the drive wheel only when a two track cartridge is inserted into the converter cartridge. Also, the intermediate idler wheel has portions of different diameter to compensate for friction losses.



3,662,124
DIRECTIONAL MICROPHONE FOR HEARING AID

Otto Hassler, and Johannes Wittkowski, both of Hamburg, Germany, assignors to Willco-Horgerate Medizinische Appgratebau GmbH, Hamburg, Germany

Continuation of application Ser. No. 682,346, Nov. 13, 1967, now abandoned. This application Sept. 25, 1970, Ser. No. 75,548
Claims priority, application Germany, June 5, 1967, W 44 116
Int. Cl. H04r *1/38*
U.S. Cl. 179—121 D **9 Claims**



The disclosure is directed to an improvement in a microphone used primarily in head-worn hearing aids in which the microphone achieves a directional characteristic. The chamber and aperture in front of the diaphragm or other speech-responsive member is constructed in the normal manner while the chamber to the rear of the diaphragm or other speechsresponsive member has a plurality of hollow elongated members secured within the walls of the microphone housing. The elongated members may be formed from sintered porous material such as metal, glass, or plastic, and may be arranged side-by-side or in a honeycomb arrangement. The elongated members attenuate the propagation of the sound waves, the attenuation being approximately 20 decibels lower than that reaching the other side of the diaphragm or other speech-responsive member without materially changing the inherent response characteristic of the microphone.

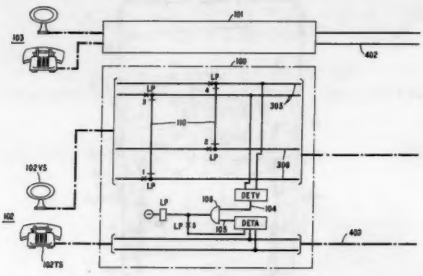
3,662,125
TELEPHONE LINE TESTING ARRANGEMENT

Charles William Haas, Jr., Middletown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed June 3, 1970, Ser. No. 43,079
Int. Cl. H04m *3/22;* **H04b** *3/46*
U.S. Cl. 179—175.2 R **13 Claims**

A four-wire communication system for interconnecting wideband lines is disclosed. The continuity and transmission

characteristics of the selected network channels and the four-wire lines are tested prior to each use. The test is made by transmitting a predetermined signal over a pair of wires and,



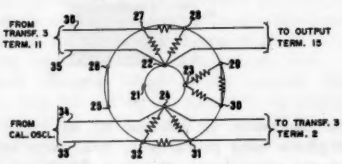
through a loopback arrangement, returned over the other pair of wires. The returned signal is then compared with signals of preselected value and if the test is satisfactory, the loopback arrangement is removed.

3,662,126

PROCESS FOR THE SIMULTANEOUS ADJUSTMENT OF ATTENUATION OF A TRANSMISSION CHAIN AND OF THE LEVEL OF A TEST SIGNAL AND APPARATUS THEREFOR

Robert Jean Chaumont, Sceaux, France, assignor to Societe Anonyme De Telecommunications, Paris, France

Filed Jan. 29, 1970, Ser. No. 6,877
Claims priority, application France, Apr. 24, 1969, 6913115
Int. Cl. H04m *1/24*; H04b *3/46*
U.S. Cl. 179—175.3 **7 Claims**



This invention relates to the maintenance of a transmission chain which, from a variable input level, delivers a constant output level. To do this, the said transmission chain comprises, in addition to its functional components, an artificial line with adjustable attenuation, which the operator can use when faced with an input level determined by elements situated up-side the said chain, so as to obtain the constant output level necessary for the working of the elements situated down-side the said chain.

In accordance with this process the value of the artificial attenuation line varies inversely to the value of the artificial attenuation line integrated in the said transmission chain.

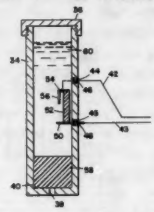
3,662,127

DIFFUSION TIMING MECHANISM

John R. Gimler, Succasunna; Stephen E. Jurman, Ledgewood, and Robert W. Schnettler, Wharton, all of N.J., assignors to Hercules Incorporated, Wilmington, Del.

Filed Sept. 26, 1969, Ser. No. 861,298
Int. Cl. H01h *7/03, 43/00*
U.S. Cl. 200—34 **4 Claims**

A timing device for controlling mechanical, electrical or chemical systems is provided which functions in response to



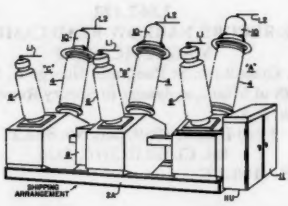
controlled diffusion of solvent through an elastomer.

3,662,128

READILY TRANSPORTABLE CIRCUIT BREAKER OF TWO-PIECE SEGMENTED FRAME CONSTRUCTION AND TWO-POSITION OPERATING MECHANISM HOUSING

David H. Neudorfer, Pittsburgh; Ronald W. Crookston, Trafford, and August U. Bertolino, Jeannette, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 13, 1970, Ser. No. 54,257
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **8 Claims**



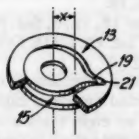
A high-power circuit interrupter frame construction is provided having a two-piece, or two-part independent frame construction rendering it adaptable for ready transportation by flat car, and having an end housing capable of being moved to two positions. The end housing, which in this case contains the gas system, terminal blocks, etc. but could also contain the operating mechanism, is moved upwardly during rail transportation on the flat car, and following assemblage in the field, the housing is lowered to its operative lowered position. As a result, a minimum of piping connections and adjustments need be made, and all major components can be tested and adjusted at the factory prior to shipment.

3,662,129

ROTARY ELECTRICAL SWITCH ASSEMBLY HAVING A ROTOR AND AN ECCENTRICALLY MOUNTED CONTACT MEMBER

Keith Lewis, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 8, 1969, Ser. No. 882,855
Claims priority, application Great Britain, Dec. 16, 1968, 59,637/68
Int. Cl. H01h *9/06*
U.S. Cl. 200—61.88 **4 Claims**



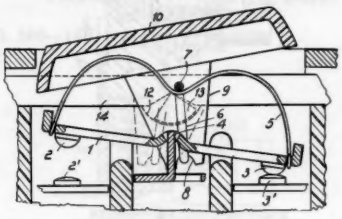
A switch for use with an automatic transmission drive selector lever of a road vehicle in which the contacts of the

switch are arranged with sufficient clearance therebetween to avoid arcing between the contacts and permit physical mounting of the contacts while allowing the switch to be operated by a small angular movement. Thus, the switch may be mounted in the very small space available since the moving contact moves through a larger angular distance than the input member or shaft thereby enabling the fixed contacts to be easily accommodated.

3,662,130
RELEASE DEVICE, PARTICULARLY FOR SWITCHES OR SIMILAR, OF SMALL POWER

Angelo Bonetalli, Via Lazio 39, Varese, Italy

Filed Nov. 12, 1970, Ser. No. 88,766
Claims priority, application Italy, Nov. 29, 1969, 25127 A/69
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 G **10 Claims**

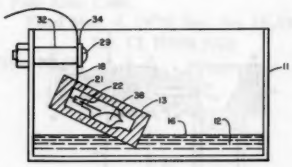


An electric switch in which the movable contact-carrier is in the form of a rockable lever, the ends of which are engaged by the ends of an arcuated leaf spring depressed by a U-shaped member. This rockable lever is operated by a rockable operating member which is provided with two parallel depending projections, embracing the U-shaped member and the movable contact-carrier.

3,662,131
ELECTRICAL LIQUID LEVEL SENSOR

Frank T. Leistiko, 5230 Bloomington Avenue South, Minneapolis, Minn.

Filed June 25, 1970, Ser. No. 49,880
Int. Cl. G08b *21/00*
U.S. Cl. 200—84 R **8 Claims**



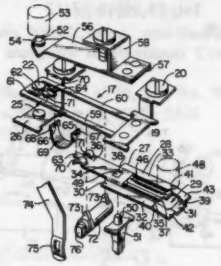
An electrical liquid level sensor utilizing a mercury switch encased in a liquid-proof, low density thermoplastic case which floats on the surface of the liquid. The mercury switch is electrically connected through the low density case by flexible electrical conductors which act as a hinge.

3,662,132
ELECTRICAL SWITCH CONSTRUCTION

Arthur L. Good, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 26, 1970, Ser. No. 5,710
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 **6 Claims**

An electrical switch construction having a support means carrying a first blade and a second blade, the blades respectively having projections extending toward each other with a rolling C-shaped spring having opposite ends provided with openings respectively receiving the projections of the blades therein. The blades each has a pair of tabs on opposite sides

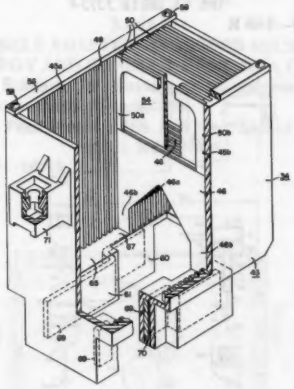


of its respective projection and being bent relative to the spring to provide knife edges bearing against the rolling spring in aligned relation with the respective slot of the rolling spring.

3,662,133
SPACE-PLATE ARC-CHUTE FOR AN AIR-BREAK CIRCUIT BREAKER

Fred Bould, and John H. Taylor, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1969, Ser. No. 800,106
Int. Cl. H01h *33/08*
U.S. Cl. 200—144 R **7 Claims**



An arc-chute of the space-plate type is provide for an air-break circuit breaker in which a molded insulating casing is provided with grooves for supporting the spaced magnetizable conducting plates. The casing has an enlarged lower opening communicating with a laterally disposed restricted opening. Additionally, the insulating casing has flange, or shelf means integrally formed therewith to prevent downward movement or blasting of the arcing gases, which are heated during the arcing interrupting operation.

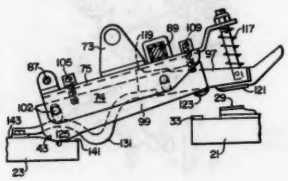
Above the space metallic magnetizable plates are provided a plurality of spaced expansion chambers, which are partitioned from each other by vertically extending solid insulating plate portions interspersed lengthwise of the arc-chute along the upper portion thereof.

3,662,134

CIRCUIT BREAKER WITH IMPROVED CURRENT PATH AND CONTACT MEANS

Albert R. Cellerini, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 11, 1969, Ser. No. 832,099
Int. Cl. H01h 33/12
U.S. Cl. 200—146 R 9 Claims



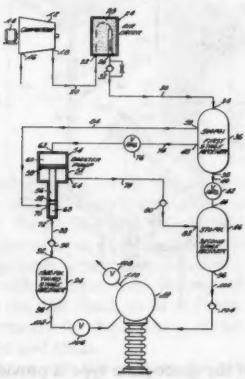
A circuit breaker, of the type comprising bridging main contact arms and an arcing contact arm, comprises an improved current path and contact means. The main contact arms and arcing contact arm are supported under the bight portion of an inverted generally U-shaped support member that is pivotally supported, above the bight portion thereof, for movement about a fixed pivot. Contact means on the main contact arms engage slanted stationary contact means generally under the fixed pivot of the support member. Improved means is provided for supporting biasing springs on the contact means.

3,662,135

GAS SUPPLY SYSTEM FOR GAS BLAST CIRCUIT BREAKER

Thomas F. Clark, Dorchester, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 10, 1970, Ser. No. 96,734
Int. Cl. H01h 33/54
U.S. Cl. 200—148 R 10 Claims



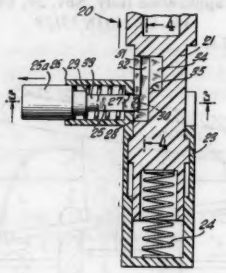
An air blast circuit breaker requires two constantly available supplies of compressed air, one at low pressure (370 psi) and the other at high pressure (1,500 psi). An air compressor takes air at atmospheric pressure, compresses it to 500 psi, and supplies it through an air drier to a first stage reservoir or receiver. Air is supplied on demand from the first stage reservoir to replenish a second stage reservoir or receiver which supplies the low pressure air to the breaker. Air is also supplied on demand from the first stage reservoir to operate and to feed a booster pump which compresses the feed-air from 500 psi to 1,500 psi and replenishes a third stage reservoir or receiver which supplies the high pressure air to the breaker. Exhaust operating air from the booster pump is supplied to the second stage reservoir. After use in the breaker, the air is exhausted to atmosphere.

3,662,136

TRIGGER MECHANISM FOR POWER TOOL

Wolfgang F. Bienwald, Huntington Station, and William J. Bowie, Bethpage, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Filed May 20, 1971, Ser. No. 145,124
Int. Cl. H01h 13/02
U.S. Cl. 200—157 9 Claims



A trigger mechanism for operating a power tool which may be assembled for "Lock-Out" operation to prevent accidental operation of the tool or for a "Lock-In" operation for continuous operation of the tool.

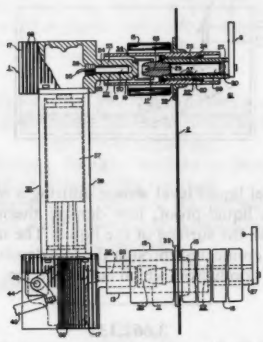
The trigger mechanism includes a movable trigger which operates an electrical switch and a control pin which controls movement of the trigger in operation of the switch.

3,662,137

SWITCHGEAR HAVING HEAT PIPES INCORPORATED IN THE DISCONNECTING STRUCTURES AND POWER CONDUCTORS

Charles M. Cleaveland, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1970, Ser. No. 4,479
Int. Cl. H01h 1/62
U.S. Cl. 200—166 K 8 Claims



The primary disconnecting contacts of a metal-clad switchgear unit has at least one, and preferably two, heat pipes incorporated in the structure thereof. The use of one or more heat pipes conducts the heat generated adjacent the point of contact separations, and removes it to a remote area, at which heat sinks may be readily provided to more easily

dissipate the heat generated at the separable contact structure. The advantage results that a cheaper material, such as aluminum, of small cross-sectional area, may be utilized instead of a solid copper disconnecting contact structure or higher currents may be carried where large conductors are restricted by available space.

Suitable finned structures may be associated with the one or more heat pipes to serve as heat-sink structures.

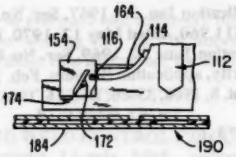
Also, where power conductors pass through locations, where radial heat flow is impeded, a heat pipe may advantageously be incorporated therein.

3,662,138

ACTUATOR FOR MOMENTARY CLOSURE OF AN ELASTIC DIAPHRAGM SWITCH

Richard H. Harris, and George J. Laurer, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,309
Int. Cl. H01h *13/50*
U.S. Cl. 200—160 **7 Claims**



An elastic diaphragm switch is operated by moving a ribbon along a predetermined path obstructed by a bearing surface on a hammer. A projection on the ribbon presses against the bearing surface on the hammer, displacing the hammer against a spring supporting the hammer. Once the hammer is fully displaced, the ribbon passes beyond the bearing surface releasing the hammer to strike the elastic diaphragm of a switch, thereby momentarily closing the elastic diaphragm switch.

3,662,139

CAVITY RESONATOR HAVING MEANS FOR REDUCING LEAKAGE OF R.F. ENERGY AT A COVERED ACCESS POINT

Kenneth E. Love, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 4, 1970, Ser. No. 16,496
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **8 Claims**

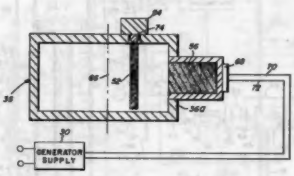
A conveyorized multimode cavity resonator is disclosed as utilized for applying microwave energy to products to be treated. The cavity includes an access port in one of the walls thereof such access port being covered by a removable cover. A conductive vane is carried from the cover and extends into the cavity adjacent the marginal lip of the access opening for reducing leakage of microwave energy from the cavity through the space between the cover and the wall of the cavity when the cover is seated in place over the access opening.

3,662,140

HIGH FREQUENCY ELECTRONIC HEATING APPARATUS

William C. Jones, Natick, Mass., and Dan R. McConnell, Iowa City, Iowa, assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 7, 1970, Ser. No. 78,713
Int. Cl. H05b *5/00*
U.S. Cl. 219—10.55 **7 Claims**



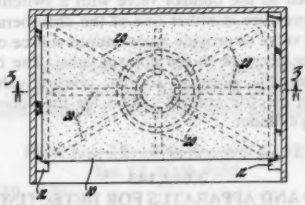
A no-load sensor in the form of a ferrite circulator is provided in the launching section of high frequency electronic heating apparatus with the body of a ferrimagnetic material oriented to display the field-displacement effect and yield nonreciprocal attenuation of electromagnetic energy. Launched energy initially is propagated to a heating enclosure with low loss. Reflected energy above a predetermined level resulting from the absence of a load or any malfunction is diverted to an energy absorber and thermal relay to terminate operation of the energy generator.

3,662,141

OVEN SHELF ADAPTED TO ABSORB MICROWAVE ENERGY AND CONDUCT HEAT TO A LOAD

George W. Schauer, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 6, 1968, Ser. No. 734,944
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **1 Claim**



This invention relates to a shelf for use in microwave ovens. A base member made up of microwave energy absorptive material is shaped to conform to the interior perimeter of the cavity with which it is to be used for converting the microwave energy into heat. Embedded within the base member are a plurality of rods of a heat conductive material arranged in a preselected pattern which will convey the heat generated within the microwave energy absorptive base material in the presence of microwave energy to an oven load.

3,662,142

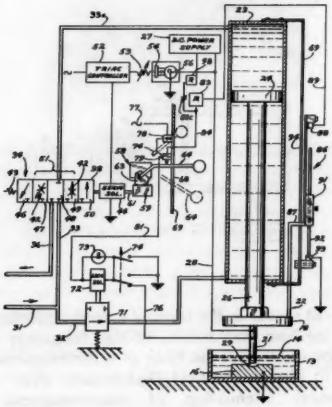
EDM MACHINE HEAD AND HYDRAULIC PRESSURE APPARATUS

Sven O. Olsson, Edina, Minn., assignor to Essar Corporation, Minneapolis, Minn.

Original application Apr. 24, 1969, Ser. No. 819,006, now Patent No. 3,604,884. Divided and this application Dec. 8, 1970, Ser. No. 96,024. The portion of the term of the patent subsequent to Sept. 14, 1988, has been disclaimed.

Int. Cl. B23p *1/08, 1/14*

U.S. Cl. 219—69 G 13 Claims



An electrical discharge machining device or EDM machine having a head carrying an electrode which is movable toward and away from a work piece by a hydraulically operated double acting cylinder. A control valve, combined with a servo solenoid and manually operated lever, is operable to control the flow of hydraulic fluid to the cylinder. A light responsive electrical control operates the servo solenoid in response to the size of the electrical discharge gap between the electrode and the work piece. Interposed in the fluid line to the hydraulic cylinder is a lock valve operable to lock the cylinder and fix the position of the electrode relative to the work piece. The manually controlled lever is operable to engage switches to override the lock valve control during the electrical machining and elevation of the electrode operations of the device. Hydraulic pressure is continuously supplied to the control valve from a pair of liquid storing chambers connected to the control valve with a switching valve. Fluid under pressure in either one of the chambers operates the switching valve to provide a continuous source of hydraulic fluid under pressure to the control valve. The head contains the hydraulic pressure source, control valve, EDM power supply, electric control circuit for the valve and the double acting cylinder.

3,662,143

METHOD AND APPARATUS FOR DETECTING AND CONTROLLING BY RELATIVE MOVEMENT BETWEEN THE TOOL AND WORKPIECE ARCING CONDITIONS IN AN EDM PROCESS

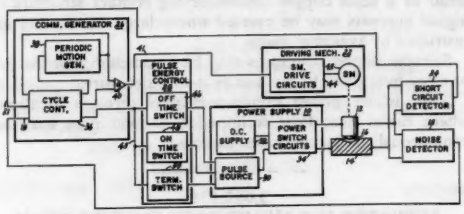
Malcolm F. Davis, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 21, 1970, Ser. No. 99,751

Int. Cl. B23p *1/08, 1/14*

U.S. Cl. 219—69 G 9 Claims

In an EDM process, a method and apparatus for controlling arcing conditions in a machining gap. An apparatus is provided for detecting the presence of a noise signal contained in a discharge. The absence of this noise signal is indicative of an arcing condition which may be detected during a single or a predetermined number of discharges. Upon detection of the absence of said noise signal, corrective action



is taken by moving the tool relative to the workpiece in a manner effective to alleviate said arcing condition.

3,662,144

APPARATUS FOR BACKING WORKPIECES FOR WELDING

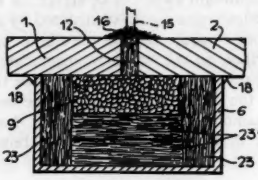
Robert Jean De Haeck, Uccle, Brussels, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, Anderlecht, Belgium

Original application Jan. 31, 1967, Ser. No. 612,864, now Patent No. 3,511,960, dated May 12, 1970. Divided and this application June 30, 1969, Ser. No. 837,771

Claims priority, application Belgium, Feb. 11, 1966, 23971; Sept. 8, 1966, 33086; Dec. 16, 1966, 37319

Int. Cl. B23k *9/18*

U.S. Cl. 219—73 5 Claims



The invention relates to an apparatus for electric arc welding of two spaced plates forming a horizontal weld groove. The apparatus comprises a U-shaped trough which is beneath the weld groove, which extends from one plate to another and which contains a granular refractory material in position to contact the plates along the welding groove, elastic and compressible cushions being interposed between the said granular material and respectively both lateral arms of the U-shaped trough and contacting elastically both plates along these arms, another elastic and compressible cushion being further interposed and elastically compressed between the said granular material and the base of the said U-shaped trough.

3,662,145

STUD WELDING TOOL CONSTRUCTION

Howard N. Wieland, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

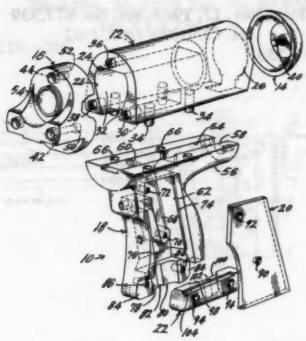
Original application Apr. 19, 1968, Ser. No. 722,607, now abandoned. Divided and this application May 20, 1970, Ser. No. 51,029

Int. Cl. B23k *9/20*

U.S. Cl. 219—98 2 Claims

The body of a stud welding tool is made of a plurality of separate parts. The main housing of the tool thereby can be employed for different applications without the necessity of designing and molding a different housing for each application. The handle of the welding tool body is made of several portions which enable an operator to have access to the interior more readily and more easily. The welding tool also has an internal component through which current is supplied

to a chuck of the tool, and which causes fasteners to be transferred from a point behind the chuck into the chuck.



The component is compact and relatively maintenance free. In particular, the welding tool can be substantially shorter and lighter than those of a like nature heretofore employed.

3,662,146

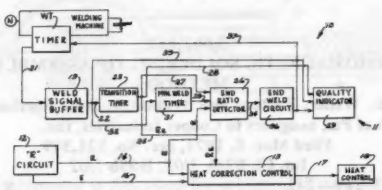
END WELD CONTROL CIRCUIT

Peter W. Vanderhelst, Livonia, Mich., assignor to Robotron Corporation, Detroit, Mich.

Original application July 3, 1967, Ser. No. 650,789, now Patent No. 3,518,395, dated Aug. 30, 1970. Divided and this application Jan. 19, 1970, Ser. No. 8,140

Int. Cl. B23k 9/10

U.S. Cl. 219—110 **3 Claims**



A resistance drop welding control circuit includes apparatus operable in conjunction with the weld timer of a resistance welding machine for terminating the weld interval in response to a drop of the welding resistance value to a preselected fraction of its peak value. A buffer circuit driven by the weld timer provides an output during the weld interval. A transition timer energized thereby provides a first transition signal during the initial part welding interval during which resistance irregularities and instabilities are likely to occur and a second transition signal for the remainder of the weld interval. A signal proportional to the instantaneous welding resistance is applied to an end ratio detector. The second transition signal is applied to the end ratio detector to allow it to store the peak value of the resistance signal. After the minimum time normally required to achieve a good weld has passed a minimum weld timer energizes the end ratio detector in synchronism with the alternating power supply to the welding machine to cause the end ratio detector to provide an output upon concurrence of completion of a whole number of cycles of welding current flow and a drop in the instantaneous welding resistance to a preselected fraction of its peak value. An end weld circuit energized by said output thereupon causes the weld timer to terminate the weld interval. A quality indicator responds to termination of the weld interval by the weld timer prior to energization of the end weld circuit to indicate a possible defective weld.

3,662,147

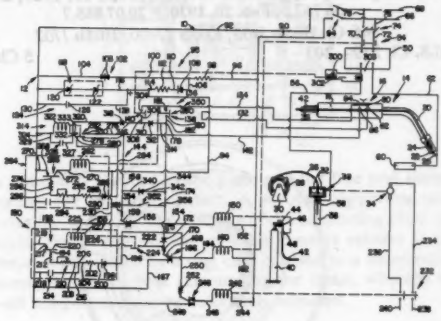
WELDING GUN TRIGGER CONTROL CIRCUIT

Ralph Ogden, Sr., Munster, and Gerald E. Enoksen, Crown Point, both of Ind., assignors to Ogden Engineering Corporation, by said Gerald E. Enoksen

Filed Mar. 26, 1970, Ser. No. 22,948

Int. Cl. B23k 9/10

U.S. Cl. 219—131 R **5 Claims**



A MIG welding gun trigger control circuit in which the welding gun trigger is employed to control the supply of welding gas, welding current, and welding wire feed to the gun, with the arrangement being such that to start the welding the operator presses the trigger to obtain a pre-welding gas purge without welding current or wire feed, and after the pre-welding gas purge is completed, the trigger is released to start the wire feed and provide welding current as well as continue the shielding gas flow. If the arc forms, the operator proceeds and completes the weld without having to hold the trigger switch closed, and when the weld is complete, the operator again presses the trigger switch to stop the wire feed but provide continued gas flow for post-welding purge, this action setting into motion a timer circuit that briefly continues welding current supply for stub burn off. After post-purge, release of the trigger switch shuts off the welding system and re-sets the system for the next welding operation. If the arc fails to form during the start cycle or if the arc or the weld current is broken during the actual weld, the control system automatically shuts itself off.

3,662,148

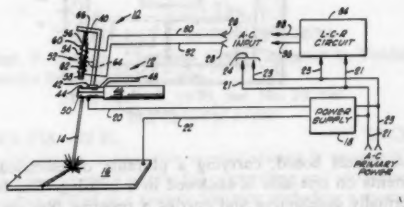
WELDING AID ATTACHMENT

Robert W. Blosser, 305 East Ridgewood Drive, Midwest City, Okla., and Gordon L. Richard, 1400 Brookdale, Del City, Okla.

Filed June 18, 1970, Ser. No. 47,525

Int. Cl. B23k 9/30

U.S. Cl. 219—136 **5 Claims**



Apparatus for detachable affixture to or integral design in an electric arc welding manual electrode holder, the ap-

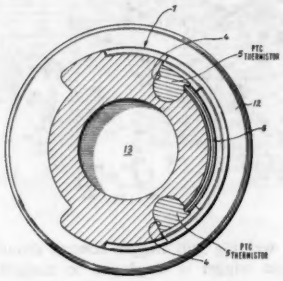
paratus consisting of an electrically driven, lineally oscillatable vibratile element which is driven in synchronous relationship with current application to the electric are welding electrode thereby to set up a uniform vibrational pattern of the welding electrode relative to a work piece in order both to avoid sticking and to insure uniformity of the welding bead.

3,662,149

HEATED LOCK FOR MOTORCARS

Reinhard Lipinski, Altbach, Germany, assignor to Pebra GmbH Paul Braun, Esslingen, Germany

Filed Sept. 14, 1970, Ser. No. 71,861
Claims priority, application Germany, Sept. 19, 1969, G 69 36 767.5; Feb. 20, 1970, P 20 07 885.7
Int. Cl. H05b *3/02*; E05b *17/00*; H05b *1/02*
U.S. Cl. 219—201 **5 Claims**



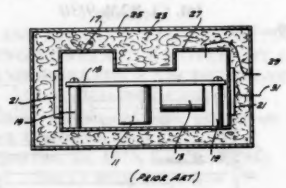
At least one PTC thermistor whose resistance rises abruptly at a temperature near 32° F. is mounted on the casing or cylinder of a car lock and permanently connected to the car battery for heating the lock by the ohmic resistance of the thermistor without draining the battery at higher temperatures to prevent freezing of the lock. "In one embodiment, the thermistors, enveloped in a minimum amount of potting compound, are locked within radially extending blind bores provided in the outer surface of the casing. In another embodiment, the thermistors are positioned in any available recess on the outer surface of the casing and held in close thermal contact therewith by a split ring clamp. As a further alternative, the thermistors may be installed in a normally movable lock part, such as the cylinder."

3,662,150

CONTROLLED TEMPERATURE CIRCUIT PACKAGE

Dale H. Hartung, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 18, 1971, Ser. No. 107,378
Int. Cl. H05b *1/00*
U.S. Cl. 219—209 **9 Claims**



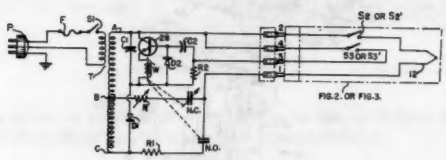
A circuit board, carrying a plurality of electrical components on one side is enclosed in a housing. The board is thermally conductive and carries a resistive film on its opposite side through which current may be driven to keep the filter components at a desired temperature.

3,662,151

CAUTERY

Paul C. Haffey, Duxbury, Mass., assignor to Codman & Shurtleff, Inc.

Filed Nov. 17, 1969, Ser. No. 877,339
Int. Cl. H05b *1/00*, *1/02*
U.S. Cl. 219—233 **9 Claims**



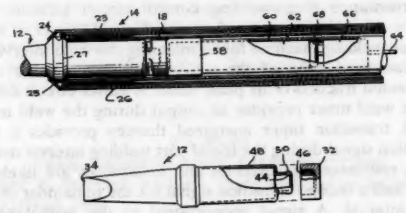
A hot wire surgical cautery has a casing which serves as a handle. A resistance wire cautery tip is connected to one end of the handle. Associated with the handle are two switches. The first switch responds to pressure from the surgeons's finger to cause electric current to flow through the tip and heat the tip to the desired cauterizing temperature. The other switch, which may be either a finger-pressure actuated switch similar to the first switch or a mercury switch automatically operated by raising the tip end of the tool, enables an electric circuit connected to the cautery to increase the voltage applied to the tip and thereby appreciably increasing the temperature thereof. This increase in temperature cleans the tip by burning off undesired residue clinging thereto. The increase in tip temperature for cleaning purposes is only temporary and the normal tip energization is automatically restored after a short period of time regardless of whether the second switch remains closed. A temperature control provides the exact tip temperature desired.

3,662,152

THERMOMAGNETIC SOLDERING TIP ASSEMBLY AND METHOD

Carl E. Weller, Easton, and Wilbur A. Solt, Northampton, both of Pa., assignors to Cooper Industries, Inc.

Filed Mar. 5, 1971, Ser. No. 121,389
Int. Cl. B23k *3/02*; H05b *1/02*
U.S. Cl. 219—241 **8 Claims**

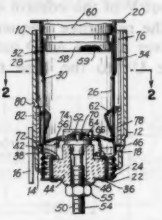


A cup-shaped thermomagnetic temperature sensing element is secured to the soldering tip of a heat controlled electric soldering iron by electroplating the shank end of the tip which fits into the cup-shaped thermomagnetic element with a thin coat of iron. The electrodeposited iron coating produces an enlargement at the edges of the reduced diameter shank forming a tapering surface axially inwardly. The cup-shaped thermomagnetic element may then be positioned over the enlargement and mechanically deformed around said enlargement to securely hold the thermomagnetic element to the end of the soldering tip.

3,662,153
ELECTRIC CIGAR LIGHTERS

Robert Gilbert Barnes, Jr., and Arthur Warren Schnick, both of Meriden, Conn., assignors to AMF Incorporated

Filed Oct. 26, 1970, Ser. No. 83,876
Int. Cl. F23g 7/24
U.S. Cl. 219—265 4 Claims

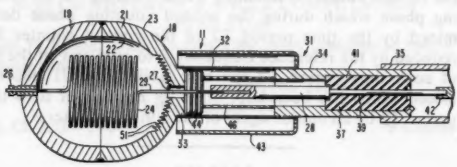


An electric cigar lighter having a socket assembly and a lighter plug including a heating element in said socket assembly. Thermostatic means for interrupting the electric current through the socket assembly in the event the lighter plug is held in energizing position for a longer time than needed to bring the heating element of the plug to incandescence.

3,662,154
SPHERICAL TITANIUM SUBLIMATOR

David J. Harra, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 19, 1970, Ser. No. 81,982
Int. Cl. F22b 1/28
U.S. Cl. 219—271 18 Claims



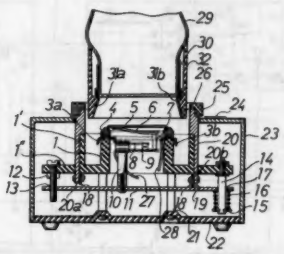
A sublimator is described for subliming a material such as titanium. The sublimator comprises a generally spherical hollow body of the material to be sublimated enclosing a source of heating energy. The wall of the hollow body is uniformly thick over its full extent, and the configuration of the heat source is correlated to the inner surface of the spherical body to provide a generally uniform rate of total heat energy absorption at substantially all portions of the body. The result is that the body sublimates uniformly from its full outer surface, and at the time in which any one portion of the body is fully dissipated, i.e., when an aperture appears through the body, the remaining portion of the body is also substantially dissipated.

3,662,155
BASE UNIT FOR ELECTRIC LIQUID WARMER

Yujiro Komazaki, Urawa, and Takeshi Watanabe, Chigasaki, both of Japan, assignors to Nakano Shunsuke, Tokyo, Japan

Filed Aug. 7, 1970, Ser. No. 61,994
Claims priority, application Japan, Aug. 19, 1969, 44/78120
Int. Cl. H05b 1/02, 3/02
U.S. Cl. 219—432 4 Claims

An electric liquid warmenr includes a vessel having an electric heater at its lower periphery and a base unit which detachably receives the vessel. The base unit and vessel have cooperating electrical contacts whereby the circuit to the heater is completed when the vessel is supported on the base unit. Carried by the base unit is an adjustable temperature control for effecting on-off control of the heater circuit. The control includes a fixed heat sensing plate disposed close to the bottom of the vessel and a thermostat including a bimetal, a fixed contact and a movable contact. One end of

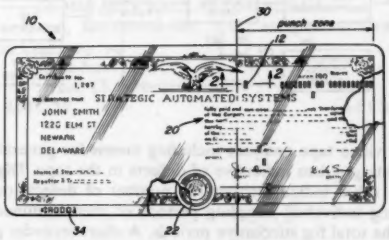


the bimetal is secured to the plate and the free end thereof operates the movable contact. A pivoted supporting plate carries the contacts. The position of the supporting plate and thereby the position of the movable contact relative to the bimetal is adjustable by a ring cam coupled to a temperature control ring on the base surrounding the vessel, whereby the on-off temperature can be selectively adjusted.

3,662,156
LAMINATED RECORD CARD COMPRISING INTERNAL LAYER OF HIGH TENSILE STRANDS

Gregory Grosbard, Long Beach, N.Y., assignor to Strategic Automated Systems, Inc.

Filed Sept. 16, 1968, Ser. No. 759,840
Int. Cl. G06k 19/08; B32b 5/08
U.S. Cl. 235—61.12 26 Claims



A record card made from a body of material so formed as to provide security against unauthorized use and coding. High tensile strands distributed within an internal layer of the card limit punch hole recording to a particular computer program as well as to increase the strength of the card and form internal surfaces for reception of printed matter and magnetic read out coatings.

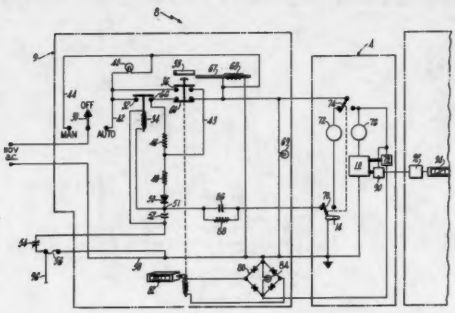
3,662,157
POST PAY CONTROL SYSTEM

William P. Somers, Cheshire, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Apr. 17, 1970, Ser. No. 29,446
Int. Cl. G01f 11/00
U.S. Cl. 235—92 FL 13 Claims

A self-service automotive service station is provided with an electrical control system for controlling and recording the dispensing of fuel at a remote location including a momentary contact switch for energizing a remote relay which is latched in during each dispensing operation and a switch at

the dispensing station which momentarily shunts the relay coil at the end of each dispensing operation through a capacitor to open the relay. The system includes interlocks for preventing the resetting of the remote register during



operation and for assuring the complete resetting of the register prior to the energization of the coil. It may include a remote cumulative register which is not disabled during attendant operation.

3,662,158

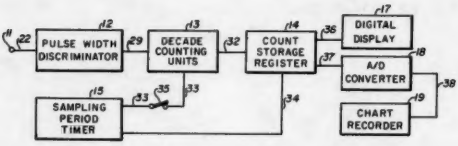
VIDEO TAPE ANALYZER AND METHOD

Janet C. Wong, Foster City, and Sidney C. Chao, Palo Alto, both of Calif., assignors to Kaitronics, Belmont, Calif.

Filed Mar. 3, 1969, Ser. No. 803,919

Int. Cl. G06m *11/00*

U.S. Cl. 235—92 PC **2 Claims**



A video tape analyzer including means for generating and counting pulses indicative of defects in the tape. Digital display tubes indicate either the number of defects occurring during individual sampling periods of predetermined length or the total for successive periods. A chart recorder provides a profile record of the characteristics of the tape.

3,662,159

METHOD OF DIGITALLY COMPUTING THE SQUARE OF THE RATIO OF A VARIABLE MEASURING FREQUENCY TO A CONSTANT BASE FREQUENCY

Alfred Schief, Karlsruhe, Germany, assignor to August Sauter KG, Ebingen, Germany

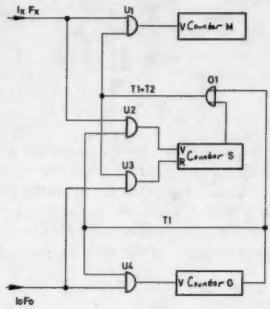
Filed Sept. 9, 1970, Ser. No. 70,699

Claims priority, application Germany, Sept. 19, 1969, P 19 47 605.2

Int. Cl. G06f *7/46*

U.S. Cl. 235—150.3 **7 Claims**

A method of digitally computing the square of the ratio of a variable measuring frequency f_x to a constant base frequency f_{xo} using a constant reference frequency f_o, especially in measuring weights on a string-type scale by employing a measuring counter, a base time counter and a control counter, comprising the steps of simultaneously with the initiating of the counting operation producing a series of electrical pulses I_x with a frequency F_x proportional to the signal frequency f_x, feeding this series of pulses to the measuring counter for a counting period comprising two counting phases the first one of which is set by the base time counter, producing a series of electrical reference pulses I_o with a frequency F_o proportion to the base frequency f_{xo}, feeding the reference pulses I_o in excess of pulses I_x to the control counter which sets the second one of the counting phases, the measuring frequency f_x after the beginning of the counting is fed to the measuring counter M over a first AND gate UI and over a second AND gate U2 to an input V of the control counter S also having a second input R, the reference frequency f_o being fed to the second input R over a third AND gate U3, and also over a fourth AND gate U4 to the base time counter G which



counts from zero up to a predetermined number and thereby sets the period T2 of the first counting phase during which an output signal of the base time counter is fed into the second and fourth AND gates U2, U4, such output signal keeping the second and fourth AND gates open during the first phase, the control counter S attaining a count during the fist counting phase which during the second counting phase determined by the time period T2 of the control counter S is reduced by the reference frequency f_o to zero and, at the end of such time period T2 the first AND gate U1 becomes closed which has been kept open till the end of such time period T2 by an output signal of the control counter S.

3,662,160

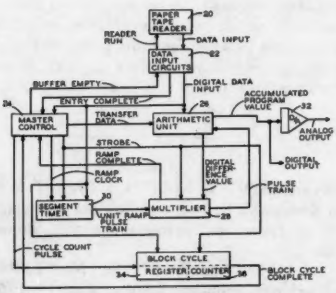
ARBITRARY FUNCTION GENERATOR

Ronald R. Hoppes, Royersford, Pa., assignor to Weston Instrument, Inc., Newark, N.J.

Filed Jan. 11, 1971, Ser. No. 105,465

Int. Cl. G06j *1/00;* **G06g** *7/26*

U.S. Cl. 235—150.53 **3 Claims**

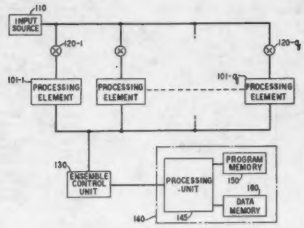


A function generator is provided which accepts digital commands and produces a desired arbitrary function of time as a digital and analog output signal. The generated output functions are composed of sequentially connected linear ramp segments.

3,662,161
GLOBAL HIGHLY PARALLEL FAST FOURIER TRANSFORM PROCESSOR

Glenn D. Bergland, Morris Township, Morris County, and Donald E. Wilson, Brookside, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 3, 1969, Ser. No. 873,587
Int. Cl. G06f 7/38, 15/34
U.S. Cl. 235—156 17 Claims

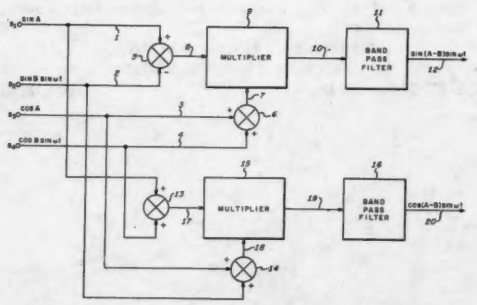


A fast Fourier transform processor and associated process wherein an input sequence of samples is broadcast to each of a plurality of parallel processing elements where sets of accumulated sums of products of these samples with appropriate trigonometric function values are maintained. These sets of accumulated sums are then individually Fourier transformed in parallel to form the Fourier coefficients corresponding to the original input sequence.

3,662,162
SUM OR DIFFERENCE ANGLE COMPUTATION APPARATUS

Frank H. Kallio, Black Canyon City, Ariz., assignor to Sperry Rand Corporation

Filed Apr. 24, 1970, Ser. No. 31,544
Int. Cl. G06g 7/22
U.S. Cl. 235—186 9 Claims

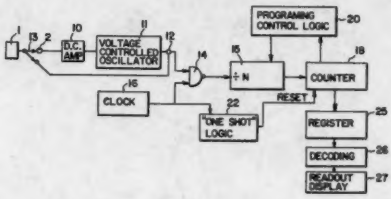


Apparatus for providing a signal representative of a trigonometric function of the sum or difference between two angle variables including a pair of linear combiners responsive to respective input trigonometric functions of the angle variables and a multiplier connected to receive the combiner outputs for producing a resultant product signal containing d.c. and second harmonic components in addition to the desired trigonometric function, the latter being readily separated from the remainder of the signal by means of appropriate frequency selective apparatus connected to the multiplier output.

3,662,163
DIGITAL SIGNAL LINEARIZER

David E. Miller, Beverly, and Robert C. Heil, Peabody, both of Mass., assignors to General Electric Company

Filed Aug. 4, 1970, Ser. No. 60,820
Int. Cl. G06f 15/34; H03k 13/20
U.S. Cl. 235—197 7 Claims

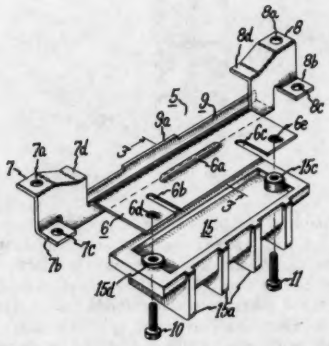


A digital signal linearizer for obtaining a linear digital output from a non-linear input. The input voltage is a non-linear representation of a quantity, such as temperature as measured by a thermocouple sensor. A voltage controlled oscillator converts the input voltage to a pulse train having a pulse rate which is a linear representation of the input voltage, but like the input voltage, is a non-linear representation of the measured quantity. The pulses are connected through a NAND gate to programmable N frequency divider for fixed repeated intervals. Hence, the number of pulses passed depends directly on the repetition rate of the oscillator output pulses. Since the voltage, and hence pulse rate v. Quantity measured characteristics of the sensor are known, the divider is programmed to provide a division factor n which varies over different segment of the range of interest so that the output pulse count from the divider is linearly related to the quantity being measured.

3,662,164
LUMINAIRE BALLAST BRACKET

David L. Wood, Hendersonville, N.C., assignor to General Electric Company

Filed Nov. 18, 1970, Ser. No. 90,724
Int. Cl. F21s 1/10; H05b 33/02
U.S. Cl. 240—25 14 Claims

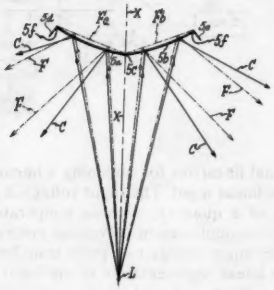


A bracket for holding electrical ballast devices of different sizes within the housing of a street lighting luminaire. The bracket is hung within the luminaire housing and has portions of different levels for accommodating ballasts of different widths, and it positions the ballast in selective engagement with stepped bearing bosses formed in the housing top wall.

3,662,165
LUMINAIRE REFLECTOR

Mitchell M. Osteen, Zirconia, and James L. Grindle, Hendersonville, both of N.C., assignors to General Electric Company

Filed Mar. 2, 1970, Ser. No. 15,449
Int. Cl. F21v 7/09
U.S. Cl. 240—103 R 6 Claims

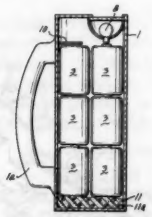


An industrial luminaire has a dome-shaped reflector formed of vertically elongated facets arranged at angles to one another around the axis of the reflector, each facet having a convex reflecting surface, so that rays are not reflected back through the light source and are dispersed by each facet to overlap the illumination provided by other facets.

3,662,166
BATTERY-OPERATED UNIT

Johannes Dietz, P.O. Box 61.800, Caracas, Venezuela

Filed Apr. 17, 1970, Ser. No. 29,452
Int. Cl. F21l 7/00
U.S. Cl. 240—10.68 8 Claims

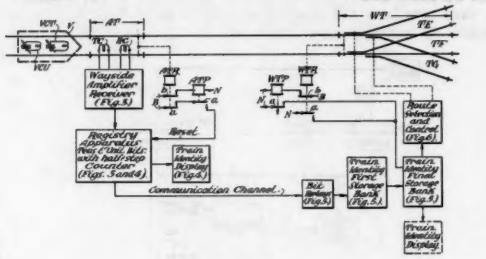


A battery-operated unit has a casing one of whose opposite ends is provided with an end wall. At least one battery is received in the casing and has two spaced contacts of opposite polarity one of which faces the endwall. Conductive means contacts the other pole and extends to the region of the end wall. An element composed of synthetic plastic foam material, either made electrically conductive by embedding of metallic material, or metallic coated or metallically wrapped completely or in part, is elastically compressed between the battery and the end wall and in conductive contact with the aforementioned one pole and with the conductive means. A switch is provided in the thus established circuit for opening and closing the same as desired, and an electrical user device is also connected in the circuit, such as a light bulb, a radio receiver, a motor or the like.

3,662,167
TRAIN IDENTITY CONTROL SYSTEM

Joel E. Elcan, Monroeville, and Arthur Paul Jackel, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Apr. 9, 1970, Ser. No. 26,884
Int. Cl. B61l 11/08
U.S. Cl. 246—2 F 11 Claims

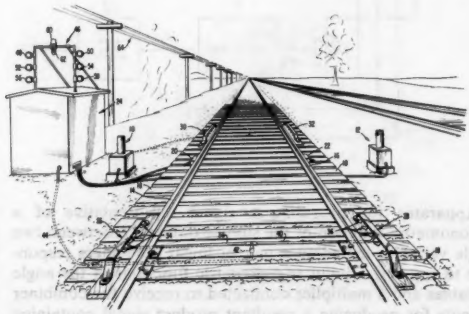


A selectively tuned train coil is provided for each digit of a train's identity number, mounted to successively couple, in descending digit order, with coils of the wayside receiving apparatus. Each digit successively received by the wayside apparatus is immediately translated from decimal to a two-out-of-five code format and temporarily registered in a separate bank of code bit relays. This identity code is transmitted to a remote location including a route type interlocking control system. Each identity code is received and cascaded through a series of relay storage banks, reaching the final bank when the corresponding train is next to arrive at the interlocking. The code readout circuit network, which automatically selects the desired route control relay, includes a code format checking matrix, to assure that two but only two bits are actually registered for each identity digit, and a translation matrix to reconvert the unit digit code to decimal form.

3,662,168
VEHICLE FAULT INDICATING APPARATUS

William M. Pelino; Raymond A. Moenich; Benjamin F. McLean, all of Richmond, and James C. Hamblin, Highland Springs, all of Va., assignors to Railtron Corporation, Richmond, Va.

Filed Mar. 24, 1969, Ser. No. 809,633
Int. Cl. B61l 3/06; B61k 9/06
U.S. Cl. 246—169 D 10 Claims



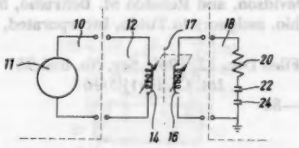
An apparatus for providing visual indications of vehicle faults including an indicator light array and improved means for selective spraying of vehicle members with a marking fluid.

3,662,169

APPARATUS FOR EXPOSING A WEB MATERIAL TO A CONTROLLABLE SPARK DISCHARGE

Bent Sorensen, and Frank Hogfeldt, both of Trittau, Germany, assignors to Softal Elektronik GmbH, Hamburg, Germany

Filed Apr. 10, 1970, Ser. No. 27,252
Claims priority, application Germany, Apr. 10, 1969, P 19 18 145.4
Int. Cl. H01j *37/00*; G01n *23/00*
U.S. Cl. 250—49.5 TC 4 Claims



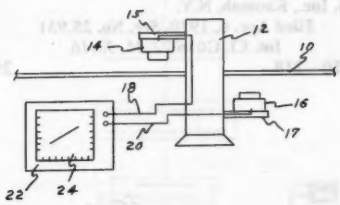
Apparatus for spark discharge treatment of a web of material wherein the discharge is continuous. A constant frequency oscillator drives the primary of a high-frequency power transformer which is closely coupled to the secondary of the transformer on a closed ferrite-core having low dispersion. The self-induction of the core is variable to keep the product of inductance and load impedance constant. The spark gap is connected to the transformer secondary. The inductance is chosen so that, with the capacitance of the spark gap and of the material web, the circuit is resonant at the operating frequency. The load on the oscillator is accordingly purely resistive.

3,662,170

METHOD AND APPARATUS FOR MEASURING THE THICKNESS MOISTURE PROFILE OF FIBROUS WEBS

Marion A. Keyes, IV, South Beloit, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 21, 1970, Ser. No. 39,356
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 H 6 Claims



A method and apparatus therefore for measuring the "Z" direction moisture profile in fibrous webs by the use of a pair of backscatter type gauges mounted in operable relationship with a fibrous web and adapted to transmit a signal in proportion to moisture in the web, such that measurement of the moisture from each side of the web permits distance averaging of the moisture to obtain a "Z" direction or thickness moisture profile.

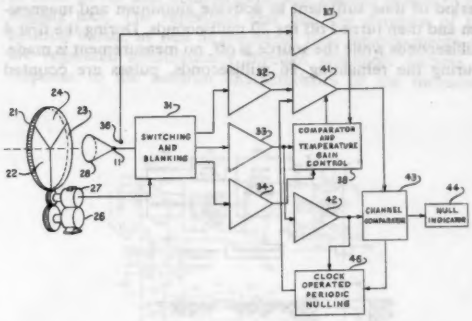
3,662,171

METHANE GAS DETECTION SYSTEM USING INFRARED

Andrew J. Brengman, Santa Clara, and Maxwell R. Krasno, San Mateo, both of Calif., assignors to Textron, Inc., Belmont, Calif.

Filed Sept. 21, 1970, Ser. No. 73,787
Int. Cl. G01n *21/26*
U.S. Cl. 250—83.3 H 11 Claims

A gas detection system utilizing infrared absorption properties of the gas in a very narrow, predetermined wavelength band located in an atmospheric spectrum window. An airborne surveillance system employs the earth as a temperature source and compensates for temperature changes by utilization of reference and analysis frequency bands while employing a large field of view.

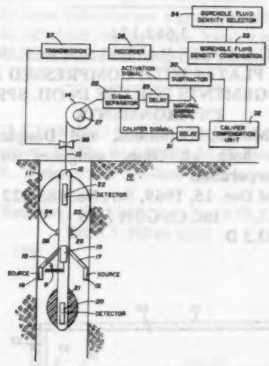


3,662,172

RADIOACTIVITY WELL LOGGING SYSTEM HAVING A PAD MOUNTED NEUTRON SOURCE AND A CENTRALIZED RADIATION DETECTOR THAT PROVIDES COMPENSATION FOR BOREHOLE FLUID DENSITY AND BOREHOLE DIAMETER VARIATIONS

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1969, Ser. No. 869,082
Int. Cl. G01t *3/00*; G01v *5/00*
U.S. Cl. 250—83.3 R 8 Claims



A well logging instrument adapted for traversing an earth borehole has a plurality of neutron sources mounted in pads which contact the wall of the earth borehole. The radiation detector is centralized in the borehole and the system provides compensation for natural gamma radiation and variations in borehole fluid density and borehole diameter.

3,662,173

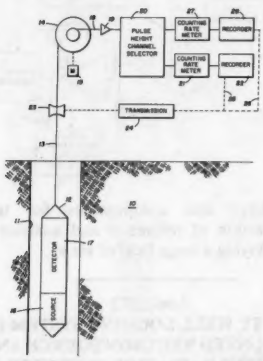
WELL LOGGING METHOD FOR DETERMINING THE PRESENCE OF ALUMINUM AND MAGNESIUM

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 27, 1969, Ser. No. 869,633
Int. Cl. G01v *5/00*
U.S. Cl. 250—83.3 R 10 Claims

An activation well logging method for determining the presence and quantity of aluminum and magnesium in formations surrounding a borehole. The formations are irradiated

with 14 mev neutrons which produce aluminum and magnesium activity with half lives of 20 milliseconds and gamma ray energy of 473 kev. The neutron source is turned on for a period of time sufficient to activate aluminum and magnesium and then turned off for 20 milliseconds. During the first 4 milliseconds while the source is off, no measurement is made. During the remaining 16 milliseconds, pulses are counted



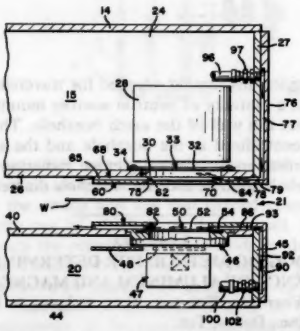
which fall in the amplitude range representing gamma ray energies from 450 kev to 500 kev. The rate of occurrence of these pulses is an indication of the aluminum and magnesium content of the formation. To correct for undesired background, the rate of occurrence of pulses in the energy intervals immediately above and below the 450 to 500 kev interval is determined and subtracted from the 450 to 500 kev measurement.

3,662,174

NUCLEONIC GAUGES HAVING SOURCE WINDOW PROTECTOR PLATES WITH COMPRESSED AIR WIPE ARRANGEMENTS FOR USE IN OIL SPRAY ENVIRONMENTS

James M. McMullen, Columbus, and Douglas A. Berg, Worthington, both of Ohio, assignors to Industrial Nucleonics Corporation

Filed Dec. 15, 1969, Ser. No. 885,222
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 D **9 Claims**



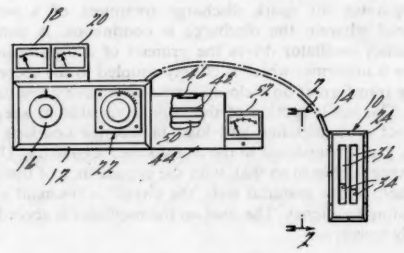
A nucleonic gauge for use with moving strip or web material in which oil particles or oil mist is entrained with the web. The nucleonic gauge incorporates protector plates, there being one plate associated with the source housing and another plate associated with the detector housing. Each plate includes air passageways through which air is directed under pressure at a region closely adjacent the source window and the detector window for preventing the occurrence of oil droplets or other foreign material on these windows. The plates further provide mechanical protection against window damage in the event that there is a break in the sheet material.

3,662,175

APPARATUS FOR GENERATING ULTRA VIOLET LIGHT

George L. Davidson, and Renaldo M. Beltramo, both of Cincinnati, Ohio, assignors to Tuttle, Incorporated, Cincinnati, Ohio

Filed Dec. 22, 1969, Ser. No. 886,987
Int. Cl. H01j 5/16
U.S. Cl. 250—86 **1 Claim**



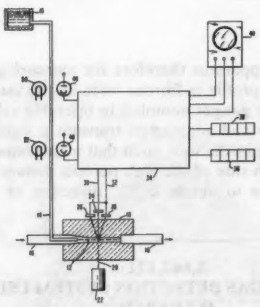
Apparatus for generating ultra-violet light which can be controlled to provide a controlled erythemal effect.

3,662,176

PHOTO-OPTICAL PARTICLE ANALYSIS METHOD AND APPARATUS

Louis A. Kamentsky, Briarcliff Manor, and Isaac Klinger, Yorktown Heights, both of N.Y., assignors to Bio/Physics Systems, Inc., Katonah, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,931
Int. Cl. G01n 21/26, 33/16
U.S. Cl. 250—218 **25 Claims**

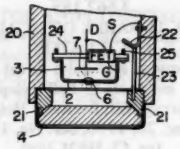


At least two different electrical optical reaction signal pulses are generated by particles passing through a beam of light. These signal pulses are electrically analyzed to discriminate true particle pulses from spurious noise pulses, to count the total number of particles, and to count a fraction of the total number of particles having particular characteristics to be distinguished.

3,662,177
IONIZATION TYPE SMOKE DETECTORS WITH FET PROTECTED AGAINST OPEN CIRCUIT INPUT

Koju Sasaki, Tokyo, and Akihiro Kobayashi, Fujisawa, both of Japan, assignors to Nittan Company Limited, Tokyo, Japan

Filed June 5, 1969, Ser. No. 830,817
Claims priority, application Japan, July 11, 1968, 43/58518
Int. Cl. G01n *23/12*
U.S. Cl. 250—44 3 Claims

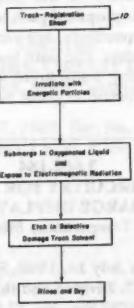


In an ionization type smoke detector wherein smoke is introduced in an ionization chamber through a mesh electrode and the change in the ionization current caused by the smoke is detected by the potential difference between the gate and source electrodes of a field effect transistor, means is provided to short circuit the gate and source electrodes in response to the removal of the mesh electrode.

3,662,178
TRACK-REGISTRATION PROCESS

Roger W. Caputi, Walnut Creek, and Wayne T. Crawford, Pleasanton, both of Calif., assignors to General Electric Company

Filed Feb. 9, 1970, Ser. No. 9,818
Int. Cl. G01t *5/00*
U.S. Cl. 250—83 CD 16 Claims


Track-Registration Sheet
10
Irradiate with Energetic Particles
Submerge in Oxygenated Liquid and Expose to Electromagnetic Radiation
Etch in Selective Damage Track Solvent
Rinse and Dry

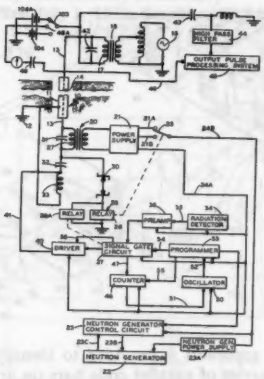
A pre-etching treatment of a track-registration film wherein the irradiated film is exposed to ultra-violet radiation immersed in oxygenated water whereby the damage tracks are sensitized while annealing of the damage tracks is prevented.

3,662,179
PULSE NEUTRON LOGGING TOOL CONTROL AND TRANSMISSION SYSTEM

Arthur H. Frentrop, and John S. Wahl, both of Ridgefield, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 25, 1969, Ser. No. 819,378
Int. Cl. G01v *5/00*
U.S. Cl. 250—83.3 R 6 Claims

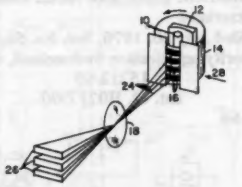
An illustrative embodiment of the invention measures the thermal neutron decay time in earth formations traversed by a borehole. For example, with a latching relay downhole, only one electrical conductor and a ground return is needed to send power and neutron generator control signals to the logging tool. The repetition rate and the duration of the neutron bursts, as well as the decay time measurements, all are regulated automatically through downhole circuits in response to the neutron characteristics of the formation under study. The single conductor and ground return also transmit the decay time measurements to the earth's surface. A gate enabling relay downhole also responds to direct current signals and selects detector count information for transmission to the surface through a manipulation of the thermal neutron decay time information signal polarity. Other information signals, of which casing collar locator signals are typical, also can be transmitted through the conductor.



3,662,180
ANGLE CODING NAVIGATION BEACON

Stig W. Jorgensen, Hollis, and Philip M. Johnson, Windham, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 17, 1969, Ser. No. 877,333
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 25 Claims



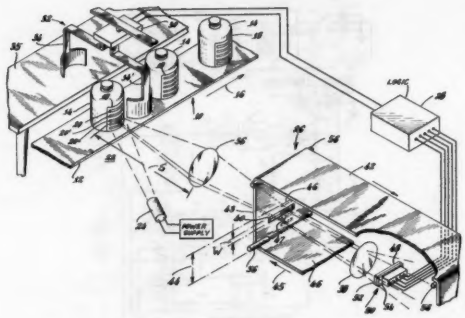
An angle coding navigation beacon comprises radiant energy projector in combination with a coded mask whereby an angle dependent code is projected into space. The angular disposition of a remote observer or receiver may be determined relative to the axis of the beacon by the type, number and sequence of energy pulses received during a predetermined time interval. The invention is amenable with a variety of energy sources including optical, acoustic and microwave energy.

3,662,181

SCANNING APPARATUS FOR THE DETECTION AND IDENTIFICATION OF LUMINESCING CODE BARS ON ARTICLES

Michael Hercher, Rochester, N.Y., and Michael Madalo, Whitehouse Station, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 22, 1970, Ser. No. 30,814
Int. Cl. G08c 9/06
U.S. Cl. 250—219 D 18 Claims



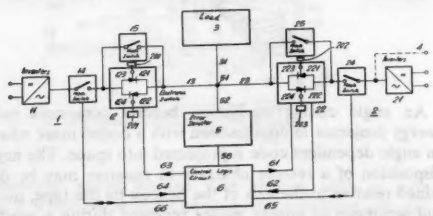
A scanning apparatus is provided to identify information encoded in a series of parallel code bars on articles moving on a conveyor. The code bars are each made up of one or more materials capable of emitting light of a distinct color when exposed to ultraviolet light. The bars are illuminated and scanned transversely by an optical system including a focussing lens and a moving belt having a slit. The moving belt is generally opaque to the emitted light from the code bars. The moving belt moves in the focal plane of the lens. A diffusing lens is located behind the belt to diffuse the image received through the slit over a group of photo detectors, each photo detector being optically filtered to respond to one of the distinct colors with an electrical output signal. The output signals of the detectors actuate logic circuitry to identify and/or sort the article.

3,662,182

METHOD AND APPARATUS FOR THE UNINTERRUPTED SWITCHING OF AT LEAST ONE ALTERNATING-CURRENT CONSUMER OF A VOLTAGE SUPPLY SOURCE OR CURRENT SUPPLY SOURCE TO A DIFFERENT VOLTAGE SUPPLY SOURCE OR CURRENT SUPPLY SOURCE

Werner Ullmann, Locarno; Renato Derighetti, Muralto, and Valentino Marazzi, Gordola, all of Switzerland, assignors to AG. Fur industrielle Elektronik AGIE Losone bei Locarno, Losone, Switzerland

Filed July 20, 1970, Ser. No. 56,590
Claims priority, application Switzerland, Oct. 9, 1969, 15212/69
Int. Cl. H02j 7/00
U.S. Cl. 307—64 10 Claims



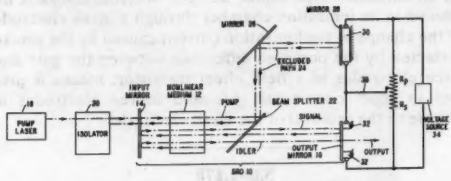
A method and apparatus for switching at least one alternating-current load from one power supply, such as a voltage supply or current supply, to another power supply, such as a voltage supply or current supply, upon the appearance of an error in the power supply coupled with the load. Each power supply possesses electronic switch means at the connection conductors to the load. An error detector determines the deviations of the waveshape of the load voltage from a predetermined waveshape of a reference voltage for a successive time interval, and upon exceeding an adjustable maximum deviation value, the electronic switch means are actuated for coupling the first-mentioned power supply to the other power supply.

3,662,183

CONTINUOUSLY TUNABLE OPTICAL PARAMETRIC OSCILLATOR

Arthur Ashkin, Rumson, and John Ernst Bjorkholm, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 28, 1970, Ser. No. 101,608
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 14 Claims



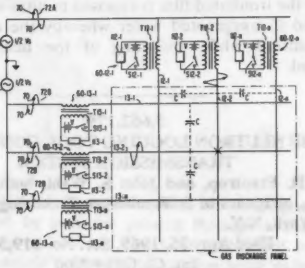
The gain curve peak and the signal axial modes are made to track together in a continuously tunable, singly resonant optical parametric oscillator (SRO) in which nonresonant pump radiation and nonresonant idler radiation are each made to reflect back upon themselves and to traverse the nonlinear medium twice. In a preferred embodiment, in at least a portion of the oscillator the pump is made to propagate in an optical path excluding the resonated signal (nonresonant idler SRO). In this portion and in the signal resonator the round-trip optical path lengths of the pump and resonated signals, respectively, are varied in accordance with a prescribed relationship. The path lengths may be altered by several means including transparent wedges, gas cells, rotating plates or piezoelectric crystals mounted on appropriate mirrors.

3,662,184

ELECTRONIC CIRCUITRY FOR A FLAT GASEOUS DISCHARGE DISPLAY PANEL

William E. Johnson, Temperance, Mich., assignor to Owens-Illinois, Inc.

Original application July 14, 1968, Ser. No. 752,626, now Patent No. 3,513,327. Divided and this application Apr. 13, 1970, Ser. No. 27,595
Int. Cl. G11c 11/28
U.S. Cl. 307—106 2 Claims



An improved pulse generator circuit primarily for multiple discharge gaseous display and/or memory panels having

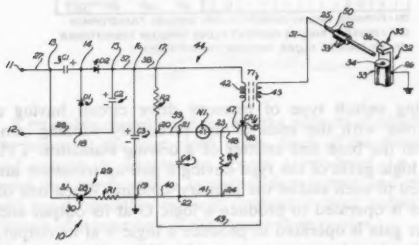
crosstalk eliminating means. A low level voltage signal from an addressing logic system is inductively translated to a high voltage unidirectional pulse and added to a periodic alternating sustaining voltage at selected times to control "on"-"off" states of selected discharge units. The improvements relate to utilization of an electronic switching circuit responsive to a spurious voltage signal to provide a low impedance to voltages induced or capacitively coupled to display lines associated therewith from other conductors. Consult the specification for other features and details.

3,662,185

SPARK GENERATOR AND COMPONENTS THEREFOR

Said Sapir, Westlake Village, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,070
Int. Cl. H03k 3/00
U.S. Cl. 307—106 6 Claims



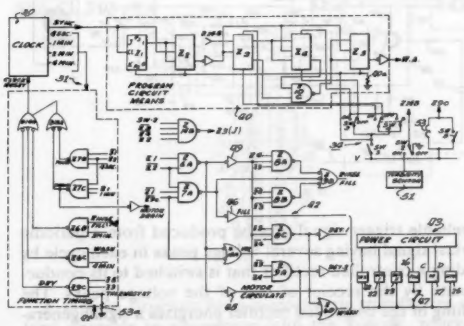
A spark igniter for gas fired devices wherein the isolated capacitor of a diode-capacitor voltage tripler is used to store electrical charge for firing the igniter. A timer is used to fire the igniter, whereby peak line current is kept very small. A special circuit is employed to disable the timer when the gas is lit.

3,662,186

ELECTRONIC CONTROL CIRCUIT FOR APPLIANCES

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation

Filed June 27, 1969, Ser. No. 837,163
Int. Cl. B01f 3/00; B28c 7/00
U.S. Cl. 307—141 36 Claims



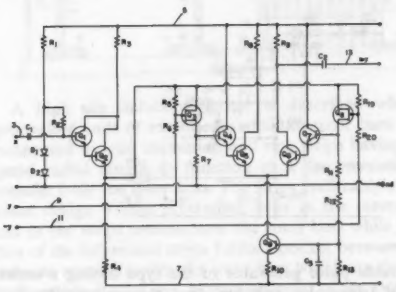
A control for a multiple function apparatus, such as an appliance, utilizing an electronic clock, or timer, electronic program circuitry and digital circuitry to select and control the functions to be performed. The electronic program circuitry has a plurality of bistable circuits, one portion controlling a series of steps repeated in each of several subcycles and the other portion controlling the sequence of subcycles. The second portion may be preset to establish a desired operating program. The digital circuitry is responsive to the condition of the bistable program circuits and to the clock to control the operation of the appliance.

3,662,187

FAST ANALOG MULTIPLIER

Dwight T. Ayres, Boalsburg, and Leon H. Sibul, State College, both of Pa., assignors to The United States of America as represented by the Secretary of the Secretary of the Navy

Filed July 1, 1971, Ser. No. 158,840
Int. Cl. G06g 7/12
U.S. Cl. 307—229 5 Claims



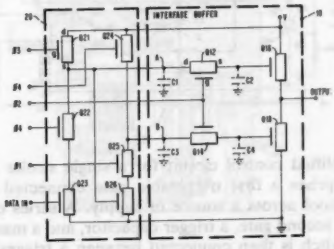
Subject disclosure relates to novel and improved high speed analog apparatus which employs field effect transistors connected in a balanced bridge circuit to obtain the product of two arbitrary input signals. One input signal drives the source-drain circuits of the field effect transistors and the other input signal drives the gate circuits of the field effect transistors. A portion of the one signal is also coupled to the gate circuits of the field effect transistors to extend the dynamic range of the same.

3,662,188

FIELD EFFECT TRANSISTOR DYNAMIC LOGIC BUFFER

Thomas A. Williams, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,183
Int. Cl. H03k 19/08
U.S. Cl. 307—233 5 Claims



A buffer circuit for interfacing multi-phase dynamic field effect transistor (FET) logic circuits with conventional logic circuits by converting pulsating logic signals to steady-state logic signals. A sampling stage gates the true and complement phases of the pulsating signal at an equilibrium state, thereby converting the pulsating signal to a steady-state level. An output stage detects the steady-state level and provides the output drive. The buffer is fabricated in accordance with

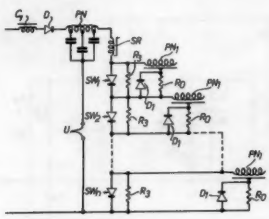
FET technology and is placed on the same monolithic chip with the multi-phase FET circuits. Circuits for generating true and complement phases of the pulsating signal are also disclosed.

3,662,189

TRIGGERABLE PULSE GENERATORS

Trevor Howard Robinson, Boreham; Alan William Cameron, and Philip Jonn Fitz, both of Chelmsford, all of England, assignors to The Marconi Company Limited, London, England

Filed Dec. 11, 1970, Ser. No. 97,066
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 L **3 Claims**



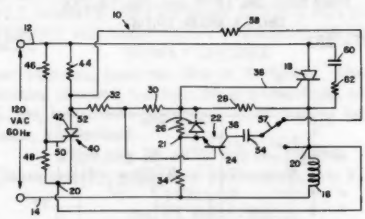
A triggerable pulse generator of the type having a series sequence of triggerable switches, that require priming, fed via a saturable inductance, a pulse forming network and a charging circuit to which D.C. voltage is applied has connected in shunt across each of the triggerable switches a damped series resonant circuit. The damped series resonant circuit is so dimensioned as to provide, for the switch with which it is in shunt the required correct priming current pulse for that switch.

3,662,190

CONTROL CIRCUIT FOR SINGLE STROKE ELECTRICAL TOOLS

Joseph S. Naber, Marengo, Ill., assignor to Fastener Corporation, Franklin Park, Ill.

Filed June 16, 1969, Ser. No. 833,321
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 N **20 Claims**



A simplified control circuit for a single stroke electrical tool comprises a first triggerable gate connected in series with the tool across a source of supply. A series circuit including a second gate, a trigger capacitor, and a manually actuated switch is then connected between a trigger terminal and a current terminal of the first gate. A silicon controlled rectifier pulse generating circuit supplies synchronizing pulses of one polarity to the second gate and charging current of the opposite polarity to the trigger capacitor. Positive feedback from the trigger terminal of the first gate to the input of the second gate gives improved triggering sensitivity and renders the circuit relatively insensitive to changes in the value of components. Multiple firing is prevented by connecting a resistor or diode between the trigger capacitor circuitry and the trigger terminal of the first gate, and by utilizing the voltage drop across the load to aid in fully discharging the trigger capacitor.

3,662,191

MEMORY DRIVE CIRCUIT

Albert H. Aley, Holliston, Mass., assignor to GTE Sylvania Incorporated

Filed Jan. 20, 1971, Ser. No. 108,090
Int. Cl. H03k *3/02*
U.S. Cl. 307—270 **6 Claims**

A	B	C	D	E	F	G	H	I	J	K	QD_1	QD_2	QD_3	QD_4
0	0	1	1	0	1	1	1	1	1	1	ON	off	off	off
0	0	0	0	1	1	1	1	1	1	1	OFF	off	off	off
0	1	1	1	1	1	0	1	1	1	1	off	ON	off	off
0	1	0	1	1	0	1	1	1	1	1	off	OFF	off	off
1	0	1	1	1	1	1	1	0	1	1	off	off	ON	off
1	0	0	1	1	1	1	0	1	1	1	off	off	OFF	off
1	1	1	1	1	1	1	1	1	1	0	off	off	off	ON
1	1	0	1	1	1	1	1	1	0	1	off	off	off	OFF

ON = FORWARD BIASING CURRENT FLOWS THROUGH TRANSFORMER
OFF = REVERSE BIASING CURRENT FLOWS THROUGH TRANSFORMER
off = NO CURRENT FLOWS THROUGH TRANSFORMER

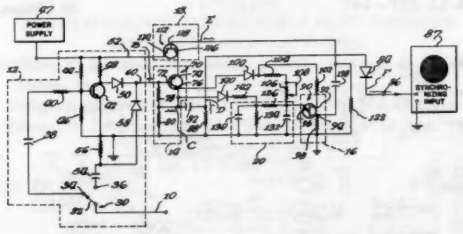
Floating switch type of memory drive circuit having a transformer with the ends of the secondary winding connected to the base and emitter of a driving transistor. TTL NAND logic gates of the type having a pull-up transistor are connected to each end of the primary winding. When one of the gates is operated to produce a logic O at its output and the other gate is operated to produce a logic 1 at its output, the driving transistor turns on rapidly. When the operating states of the gates are subsequently reversed, the driving transistor turns off rapidly.

3,662,192

FREQUENCY-SENSITIVE TRIGGERING TECHNIQUES

Michael J. Halinski, Arlington Heights, and Larry J. Wanschek, Chicago, both of Ill., assignors to Sun Electric Corporation

Filed Apr. 14, 1969, Ser. No. 815,794
Int. Cl. H03k *17/26*
U.S. Cl. 307—293 **9 Claims**



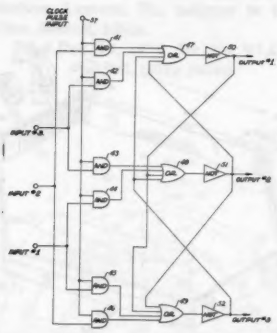
A reliable trigger signal may be produced from a periodic electrical signal having several voltage peaks in each cycle by providing a controlled rectifier that is switched to its conductive state by the receipt of one of the voltage peaks. The switching of the controlled rectifier energizes a signal generator that returns the controlled rectifier to its nonconductive state only after the occurrence of all voltage peaks in each cycle. As a result, only one trigger signal is produced in each cycle. The signal generator is controlled by a timing circuit that is charged to a progressively higher voltage as the cyclical repetition rate of the periodic electrical signal increases, thereby decreasing the time in each cycle in which the controlled rectifier conducts.

3,662,193

TRI-STABLE CIRCUIT

Robert C. Braddock, Encino, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,091
Int. Cl. H03k 19/34, 19/24
U.S. Cl. 307—291 7 Claims



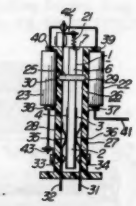
A tri-stable digital logic circuit, the outputs of which follow the inputs at the next clock pulse. Each of the three inputs and outputs is adapted to accept a two-level, i.e., binary input and to provide a corresponding output and store the said input condition through successive clock pulses until a change of at least one of the input values occurs.

3,662,194

HIGH-VOLTAGE PIEZOELECTRIC TRANSFORMER HOUSED WITH DIODES

Juichi Moriki, 1-33 Chitosecho, Nishinomiya-shi; Teruo Itoh, 1-2, Matsushitacho; Masaharu Shiosaki, 6-23, Mizuo-2-chome, both of Ibaragi-shi; Yojin Maeda, 498, Aza Shimotahara, Shijonawatecho, Kitakawachi-gun; Hisataka Kuroki, 5-35, Sawaragihigashicho, Ibaragi-shi; Kenshiro Sumi, No. 807, Shinmachi-7-Jo-Jutaku, Higashishi-shiokojicho, Shinmachi-7-Jo-Sagaru, Shimokyo-ku, Kyoto, and Hidekazu Shimura, 1-70, Higashimikunicho, Higashiyodogawa-ku, all of Japan

Continuation of application Ser. No. 712,902, Mar. 11, 1968, now abandoned. This application July 8, 1970, Ser. No. 53,164
Int. Cl. H01v 7/00
U.S. Cl. 310—9.4 7 Claims



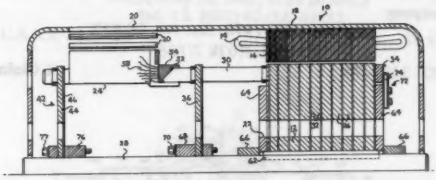
A support structure for a piezoelectric transformer of the kind operable in accordance with the λ-mode, which supports the piezoelectric transformer at the node of minimum displacement of the drive section of the transformer and is an electrical conductor so that it serves also as a lead wire. An assembly including the piezoelectric transformer, the support structure and a rectifier element is housed in a casing or enclosed in an envelope made vacuous or filled with an insulating gas so that it is usable as a high-voltage generator for television receivers.

3,662,195

HIGH SLIP INDUCTION MOTOR HAVING AN END RING FORMED OF BIFURCATED MEMBERS

Warren Pierce Wielt, Schenectady, N.Y., assignor to General Electric Company

Filed Oct. 26, 1970, Ser. No. 84,024
Int. Cl. H02k 9/22
U.S. Cl. 310—64 6 Claims



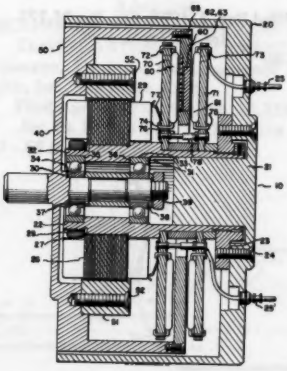
A high slip induction motor is described wherein the protruding ends of extended aluminum rotor bars are interconnected by cast aluminum end ring strips having an elongated radial length to function as a fan maximizing heat transfer from the rotor bars. The strips preferably are a bifurcated design with a protruding nose at the interconnected end of the strips remote from the rotor bars while juxtaposition of the bifurcated strips forms a pocket between adjacent strips to snugly receive the rotor bars which are then welded to the strips. Radial and arcuate restraint of the extended end of the rotor is achieved by support wheels formed of rotor laminations situated at both ends of the end ring strips to receive the extended rotor bars and protruding noses, respectively, within the conductor slots of the laminations.

3,662,196

MAGNETICALLY COMMUTATED BRUSHLESS D.C. TORQUE MOTOR

Fred Ruschmann, Port Washington, N.Y., assignor to Kollsman Instrument Corporation, Syosset, N.Y.

Filed Aug. 12, 1970, Ser. No. 63,169
Int. Cl. H02k 11/00
U.S. Cl. 310—68 B 6 Claims



A brushless direct current motor operating through the interaction of a permanent magnet field with a commutated electro-magnetic field of changing polarity wherein current is carried from the external circuit to the windings of the armature by magnetic reed switches, each switch connected at one end to the external circuit and at the other end to the terminal of successive armature windings. The switches are placed in two circular arrays, each array containing in this instance 33 equiangularly-aligned members. A rotating magnet

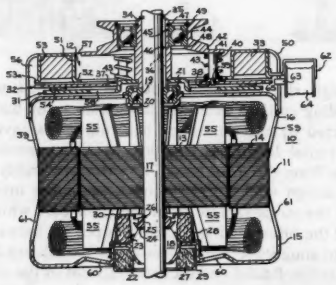
and plate assembly with two permanent magnet locations facing each of the arrays sequentially closes switches in two pairs, each pair consisting of one switch in the first array and one in the second array, to energize the armature windings at each operative position of the rotating magnet and plate assembly.

3,662,197

COMBINATION MOTOR-CLUTCH APPARATUS

Joseph C. Worst, Louisville, Ky., assignor to General Electric Company

Filed Nov. 12, 1970, Ser. No. 88,937
Int. Cl. H02k 7/108
U.S. Cl. 310—78 1 Claim



A combination motor-clutch assembly wherein the input and output members of the clutch are normally held in driving engagement by a biasing means, and having an electromagnetic coil which induces a magnetic field in the output member to overcome the operation of the biasing means and to move the output member axially to control the torque transmitted between the input member and the output member and to effect disengagement of these members.

3,662,198

TRACTION MOTOR INSPECTION COVER

John Adams, Jr., 250 South Oak Knoll Avenue, Pasadena, Calif.

Filed Dec. 4, 1970, Ser. No. 95,272
Int. Cl. H02k 5/10
U.S. Cl. 310—89 13 Claims

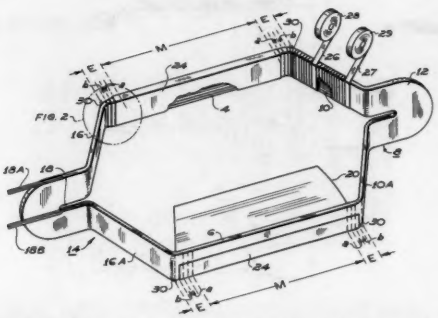
A railroad electric traction motor has a hinged door of curved rigid sheet metal for closing and conveniently opening a square inspection opening in the periphery of the curved motor housing which encloses the commutator. The door has a lock which is operable from the outside of the rigid sheet, but which has all of its parts located below the sheet top surface.

3,662,199

HIGH VOLTAGE INSULATED COIL AND MACHINE UTILIZING THE SAME

Robert L. Anderson, Bay Village, and Marvin M. Fromm, Cleveland Heights, both of Ohio, assignors to Portec, Inc., Cleveland, Ohio

Filed Mar. 1, 1971, Ser. No. 119,571
Int. Cl. H02k 3/32
U.S. Cl. 310—208 16 Claims



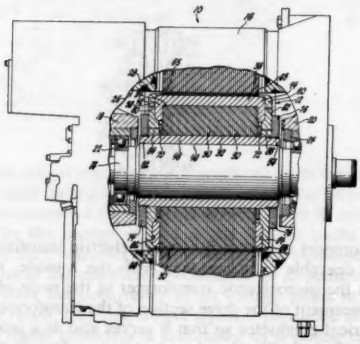
An improved insulated coil for an electrodynamic machine is prepared by wrapping multiple layers of a wide insulative wrapper impregnated with a B-staged resin bonding material around the straight section of the coil, in overlapping contact with a narrow insulative tape impregnated with the identical or a chemically compatible B-staged resin bonding material. The tape is overlapped with the ends of the wide wrapper and the wrapped assembly is then heat and pressure treated to cure the resin impregnate to a permanent, solid set and to form thereby an insulated coil with a continuous, unitary insulative joint between the wrapper and the tape.

3,662,200

SQUIRREL CAGE ROTOR WITH INTERFERENCE FIT SLEEVE BETWEEN SHAFT AND CORE

William E. Rank, Dayton, and Gene L. Dafler, New Lebanon, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 6, 1970, Ser. No. 52,558
Int. Cl. H32k 3/06
U.S. Cl. 310—211 3 Claims



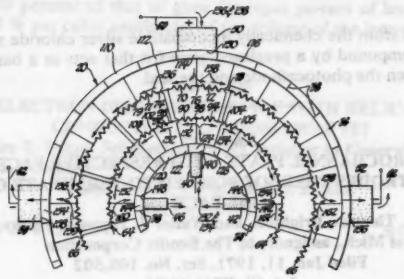
A rotor for a dynamoelectric machine includes a laminated rotor core mounted on a shaft sleeve which is mechanically expanded by an interference fit with the motor shaft. A pair

of rotor end supports are mounted on the shaft sleeve in an axially supporting relationship with the ends of the rotor core and in a circumferentially supporting relationship with the ends of a winding carried by the rotor core.

3,662,201
COMMUTATION SYSTEM FOR DYNAMOELECTRIC MACHINES

John E. Madsen, Lemont, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1970, Ser. No. 97,614
Int. Cl. H01r *39/46*
U.S. Cl. 310—220 **4 Claims**



In a preferred form, a commutation system for dynamoelectric machines includes a pair of commutator rings connected to an armature winding and carrying two sets of brushes. A plurality of working circuits are formed between pairs of brushes in the two brush sets so that work current in each working circuit flows through one pair of brush contacts. However, coils undergoing commutation in the armature winding are short-circuited by two pairs of brush contacts. This increases the brush contact resistances through which local current must flow when it is developed in the coils undergoing commutation. The increased brush contact resistances develop higher brush voltage drops to reduce the undesirable effects of the local currents without increasing losses in the work currents.

3,662,202
BRUSH HOLDING ASSEMBLY FOR MINIATURE ELECTRIC MOTOR

Takaichi Mabuchi, Tokyo, Japan, assignor to Tokyo Kagaku Kabushiki Kaisha, Tokyo, Japan

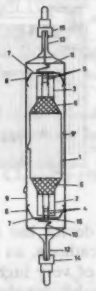
Filed Aug. 25, 1970, Ser. No. 66,760
Claims priority, application Japan, Aug. 30, 1969, 44/81959
Int. Cl. H02k *19/04*
U.S. Cl. 310—239 **4 Claims**

A brush holding assembly for a miniature electric motor comprising a pair of recessed channels provided inside of the end cover of the motor casing at diametrically opposed portions of the cover, and a pair of bores formed at opposite sides of each of said channels to receive terminals of brushes. Such a brush holding assembly is capable of a selective brush mounting according to the direction of rotor rotation.

3,662,203
HIGH PRESSURE SATURATED METAL VAPOR, PREFERABLY SODIUM OR METAL HALIDE VAPOR DISCHARGE LAMP

Bernhard Kuhl, Grunwald-Geiselgasteig, and Alexander Dobrusskin, Taufkirchen, both of Germany, assignors to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Germany

Filed May 11, 1970, Ser. No. 36,318
Claims priority, application Germany, Nov. 18, 1969, P 19 57 978.3; May 20, 1969, G 69 20 340.3
Int. Cl. H01j *61/34, 61/35*
U.S. Cl. 313—25 **18 Claims**

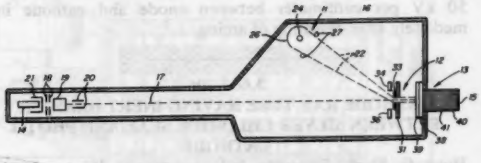


The outer envelope is of thermally highly loadable material capable of withstanding operating temperatures exceeding 500° C, such as quartz glass. It surrounds the actual arc enclosing vessel, which is likewise of thermally highly loadable material, such as quartz glass. The spacing is so close that additional heating, by thermal radiation from the outer envelope results in increased vapor density in the arc since the metal vapors in metal halide vapor discharge lamps are essentially saturated during lamp operation. A suitable ratio of the inner diameter of the outer envelope to the outer diameter of the discharge vessel is 3:1 to 1.05:1; the diameter difference being smaller than 2 cm.

3,662,204
LINE SCANNING CATHODE RAY TUBE HAVING SLOTTED STORAGE ELEMENT

Omer F. Hamann, La Jolla, Calif., assignor to Stromberg Datagraphic, Inc., San Diego, Calif.

Filed Apr. 3, 1970, Ser. No. 25,335
Int. Cl. H01j *31/18, 31/58, 29/24*
U.S. Cl. 313—68 D **2 Claims**

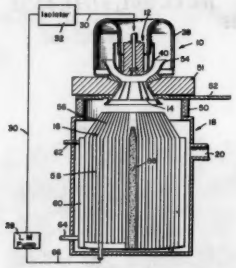


A line scanning cathode ray tube is disclosed, wherein light output is increased by provision of a flood gun and a line image storage element between the flood gun and the electron target. Resolution is maintained by disposing the storage surface along the edge of a narrow slit in an electron opaque plate. In the preferred embodiment, a fiber optics faceplate is provided to more efficiently utilize the light output.

3,662,205
ELECTRICAL SWITCH DEVICE HAVING A FED LIQUID-METAL CATHODE AND PARTIALLY INTERCEPTING ANODE

Kenneth T. Lian, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of application Ser. No. 720,707, Apr. 11, 1968, now abandoned. This application July 2, 1970, Ser. No. 52,078
Int. Cl. H01j 1/10
U.S. Cl. 313—34 14 Claims



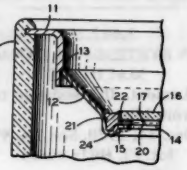
The electrical switch device has an envelope in which is mounted a liquid-metal cathode, an anode, and a condenser. The cathode is capable of very high electron-to-atom emission ratio. A desirable value for the electron-to-atom emission ratio is on the order of 100 or more and is attainable by means of a cathode such as disclosed in U.S. Pat. No. 3,475,636. The condenser has a very much larger area than the exposed liquid metal area on the cathode, and it is kept at a low enough temperature to efficiently condense the liquid-metal vapor emitted by the cathode. With mercury used as the liquid metal, the condenser temperature is kept substantially below 0° C., preferably at about −35° C. which is just above the melting point of mercury. When arcing occurs from the liquid metal, a plasma jet of electrons, ions, and neutral particles is emitted from the arc spot. The anode is mounted between the cathode and the condenser, and it partially intercepts the plasma jet. The combination of the high electron-to-atom emission ratio of the cathode with the large, low-temperature condenser results in an equilibrium background pressure (i.e., pressure outside the plasma jet) of at least as low as 10^{-3} Torr during arcing, and lower than 10^{-4} Torr during non-arcing periods. These low pressures are obtained by maintaining the condenser in the range of low temperatures defined above. This low background pressure, in turn, permits the essentially unperturbed propagation of the plasma jet between the cathode and the surfaces upon which it impinges, i.e., condenser and anode. Such a discharge mode is commonly referred to as a "vacuum arc." The fact that the plasma jet is emitted only during arcing, and that the pressure within the space surrounding this jet is kept low, results in the ability to hold off electric fields up to 50 kV per centimeter between anode and cathode immediately after cessation of arcing.

3,662,206
CATHODE RAY TUBE HAVING INERT BARRIER BETWEEN SILVER CHLORIDE SEAL AND PHOTO CATHODE

Horst G. Fleck, Titusville, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Original application Feb. 20, 1968, Ser. No. 706,967, now Patent No. 3,510,925, dated May 12, 1970. Divided and this application Feb. 24, 1970, Ser. No. 16,997
Int. Cl. H01j 39/02, 39/00
U.S. Cl. 313—94 4 Claims

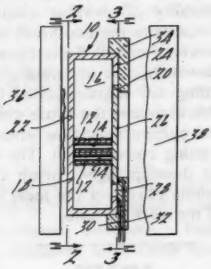
An illustrative embodiment of the invention shown a method and apparatus for joining a crystalline magnesium fluoride faceplate to the envelope of a photomultiplier tube. The bialkali photocathode deposited on the faceplate is protected from the chemically incompatible silver chloride sealing compound by a preglazed glass frit that acts as a barrier between the photocathode and the seal.



3,662,207
MICROCHANNEL PLATE WITH RESPECTIVE FACE ELECTRODES THEREOF FORMED TO TERMINATE ON ONE FACE

Neal C. Thomas, Brighton, and Walter J. Dippold, Pinckney, both of Mich., assignors to The Bendix Corporation

Filed Jan. 11, 1971, Ser. No. 105,502
Int. Cl. H01j 43/06
U.S. Cl. 313—104 6 Claims



Electron multiplier apparatus comprising a plurality of substantially equal length electron multiplier tubes stacked in a parallel relationship so as to form a cylindrical body known as a microchannel plate. The body has a pair of faces at the ends of the tube and a coating of electrically conducting material is applied to one of the faces and wrapped around the body so as to extend onto the other face. A second conductive coating on said other face has an annular space between it and the first conductive coating and lead wires, adapted to be connected to a voltage source, are connected to the coatings on opposite sides of the space for applying an electric potential between the ends of the multiplier tubes.

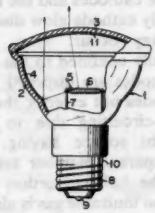
3,662,208
REFLECTOR TYPE INCANDESCENT LAMPS

Kenji Ohmae; Tomiyoshi Hirano, both of Yokohama-shi, and Takao Akaishi, Kita Kyushu-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 27, 1970, Ser. No. 6,204
Int. Cl. H01i 5/16, 61/40; H01k 1/32
U.S. Cl. 313—112 5 Claims

In a reflector type incandescent lamp having a concave reflector and a front glass, an electroconductive coating of

transparent metal oxides is applied on the inner surface of the front glass and the thickness of the coating is set to



manifest a percentage of interception of infrared rays of 20 to 80 percent of that of glass for input powers of less than 0.55 W per cubic centimeter of the volume of the lamp.

3,662,209

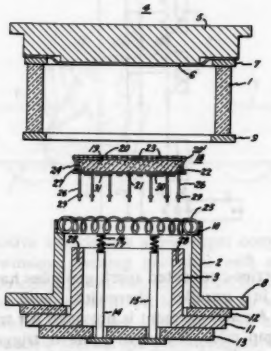
ELECTRON DISCHARGE DEVICE WITH HELICAL CONDUCTOR PROVIDING SWAP FIT

James E. Beggs, Schenectady, N.Y., assignor to General Electric Company

Filed May 21, 1970, Ser. No. 39,284

Int. Cl. H01j *1/00*

U.S. Cl. 313—237 **9 Claims**



An electron discharge device which is easily manufactured and assembled consists of three concentric cylinders, unitary cathode grid and heater assembly, a garter spring arrangement for snapping the assembly into position with respect to one of these cylinders, and arrangements for making connections to the heater, the cathode, and the control grid as the assembly is snapped into position. In one version, the device is open to the atmosphere so that it can be used in space environment to take advantage of the extremely high vacuum conditions existing in such environment.

3,662,210

ELECTRODE FOR PULSE HIGH-POWER ELECTROVACUUM DEVICES

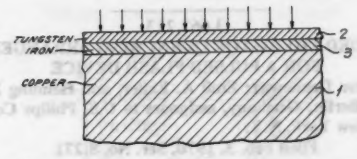
Viktor Fedorovich Maximov, ul. 8-go Marta II, kv. 7, Moscow, U.S.S.R.

Continuation of application Ser. No. 662,652, Aug. 23, 1967, now abandoned. This application Apr. 28, 1970, Ser. No. 31,818

Int. Cl. H01j *1/14, 1/48*

U.S. Cl. 313—311 **6 Claims**

A copper electrode with a multi-layer coating wherein, for example, the outer layer is of tungsten and the inner layer is of iron, the outer layer functioning as a refractory material and the inner layer being a transitional layer having thermal physical properties between those of the electrode and those



of the outer layer. Electrode with special coating to protect the same against heat.

3,662,211

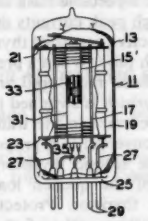
CATHODE CONSTRUCTION

Walter T. Millis, Owensboro, Ky., assignor to General Electric Company

Continuation of application Ser. No. 95,932, Mar. 15, 1961, now abandoned. This application Jan. 15, 1970, Ser. No. 4,167

Int. Cl. H01j *1/24*

U.S. Cl. 313—340 **5 Claims**



Structures and methods are disclosed for accelerating the warm-up time of an electron discharge device having an indirectly heated cathode either by coating the cathode with a high heat absorption material or by increasing the heat radiation properties of the heater.

3,662,212

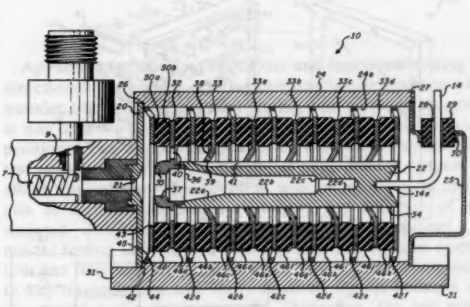
DEPRESSED ELECTRON BEAM COLLECTOR

John L. Rawls, Jr., Archer, Fla., assignor to Sperry Rand Corporation

Filed July 15, 1970, Ser. No. 54,943

Int. Cl. H01j *25/34*

U.S. Cl. 315—3.5 **9 Claims**



A rugged electron beam collector structure for velocity modulation or other high power electron beam vacuum tubes is characterized by means for providing high electrical volt-

age insulation along a low thermal impedance heat flow path. The structure is constructed of stacked ceramic and metallic elements bonded together in a configuration providing improved tolerance to thermal and other shock mechanisms.

3,662,213

CASCADED THYRISTOR QUENCHING ARRANGEMENT FOR A PULSED FLASH DEVICE

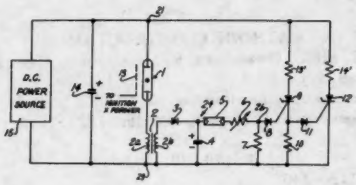
Rolf Dieter Dennewitz; Emil A. Exner, and Henning Zierau, all of Berlin, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,271

Claims priority, application Germany, June 3, 1969, 19 28 157.3

Int. Cl. H05b *37/02*

U.S. Cl. 315—149 **10 Claims**



A compact, high-speed quenching arrangement is described for use with a portable flash unit that is required to handle moderately high peak currents during quench. A pair of normally nonconductive cascaded thyristors are connected in shunt with the flash tube. When a predetermined quantity of emitted light has been monitored and integrated by the flash unit, the first thyristor is switched into conduction. The resulting build-up of current in the transconductive path of the first thyristor is converted to a proportional control voltage which triggers the second thyristor into conduction to handle the portion of the quench load that exceeds the capacity of the first thyristor. Protective resistors in the respective transconductive paths of the thyristors may be suitably selected to accommodate a range of peak current conditions of the flash device.

3,662,214

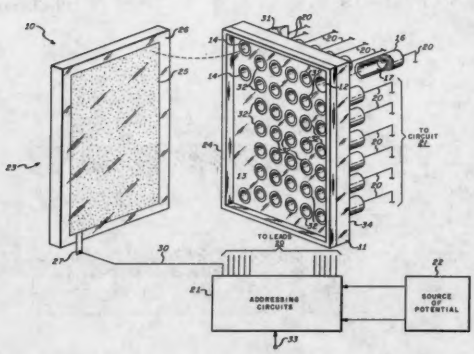
GAS DISCHARGE DISPLAY APPARATUS UTILIZING HOLLOW CATHODE LIGHT SOURCES

Claude D. Lustig, Lexington, Mass., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,608

Int. Cl. H05b *37/00*

U.S. Cl. 315—167 **33 Claims**



Gas discharge display apparatus comprising a plurality of hollow cathodes and associated anodes enclosed in a gastight envelope with an ionizable gas. The hollow cathodes are arranged in a predetermined pattern in order that ignition of gas discharges in the hollow portions of selected cathodes provides the desired display. The anodes are proximate to the hollow portions of the cathodes and the hollow portions have a depth such that only cathode glow discharges substantially confined thereto may occur. Thus, sputtered cathodic material is substantially confined to the interiors of the hollow portions. The anodes are disposed adjacent the hollow portions of the cathodes but exterior thereof for minimizing interelectrode short-circuiting due to sputtering. An individual display light source having a hollow cathode member and a transparent member sealed to the cathode member enclosing the hollow portion thereof and an associated anode with an ionizable gas is also disclosed.

3,662,215

A TRIGGERING CIRCUIT FOR TRIGGERING SERIES-CONNECTED SPARK GAPS

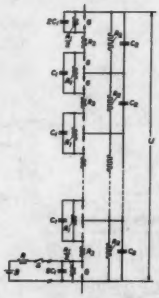
Asle Schei, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation of application Ser. No. 801,639, Feb. 24, 1969, now abandoned. This application Mar. 25, 1971, Ser. No. 128,195

Claims priority, application Sweden, Feb. 28, 1968, 2533/68

Int. Cl. H05b *37/00, 39/00*

U.S. Cl. 315—189 **4 Claims**



A chain of series-connected spark gap piles have two grading chains in parallel therewith with connections therebetween. An arrangement is provided for triggering one of the spark gap piles. When this pile is triggered, all the spark gap piles in the chain spark over if the voltage over the spark gap piles between two connections from a grading chain is not less than the spark-over voltage for each of these piles. One grading chain is formed of a number of resistors and capacitors in parallel connected across each end gap pile and each pair of other gap piles, and the other grading chain is formed of resistors in the chain between the pairs of gap piles and circuits formed of a capacitor and a resistor in parallel with each pair of gap piles.

3,662,216

ALTERNATING CURRENT POWER MODULATOR WITH PARALLEL LC CIRCUIT CONTROLLING THE RELATIVE PHASE OF VOLTAGE AND CURRENT APPLIED TO SWITCHING MEANS

Andy M. Hildebrant, San Jose, Calif., assignor to General Electric, Utica, N.Y.

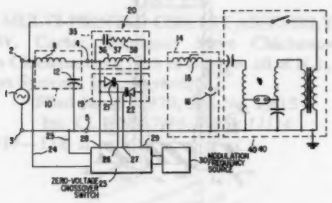
Filed June 18, 1970, Ser. No. 47,307

Int. Cl. G05f *1/38*

U.S. Cl. 315—205 **18 Claims**

A gated, bilateral switch is coupled between a resonant power supply and an alternating current load. A detuned, parallel-connected LC circuit is connected across the switch to control the phase difference between current and voltage applied to the switch and assure commutation. In the absence of triggering signals applied to the switch, the LC current

provides a first, low level of energy to the load. A zero-voltage crossover at the alternating switch gates the switch at the beginning of alternate half cycles. Power is modulated in



response to a logic circuit which alternately enables and disables the zero-voltage crossover switch at a selectable frequency and a selectable duty cycle.

3,662,217

VEHICLE CONSTRUCTION

Constantin Graf Von Berckheim, Friedrichstrasse 9, 694 Weinhein a.d.B., Germany

Filed Dec. 17, 1970, Ser. No. 99,098
Claims priority, application Germany, Dec. 22, 1969, P 19 64 069.8
Int. Cl. H01t *19/00*
U.S. Cl. 317—4 **12 Claims**

An automotive vehicle has a passenger compartment provided in a window opening provided with a windowpane which is electrically conductive at least on the side facing the interior of the compartment. At least one air supply channel is provided which discharges a stream of air along the inner side of the window and an ion-producing device is provided in the channel upstream of the window for enriching the stream of air with ions. An arrangement may also be provided for establishing and maintaining the interior of the compartment an electrostatic field.

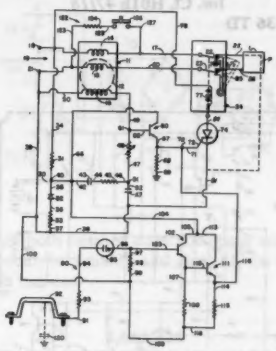
3,662,218

GROUND FAULT INTERRUPTOR CIRCUIT

George A. Whitlow, 815 Clebud Drive, Euless, Tex.

Filed June 19, 1970, Ser. No. 47,649
Int. Cl. H02h *1/02, 3/28*
U.S. Cl. 317—18 D **4 Claims**

A circuit for actuating a circuit breaker to disconnect a load from across conductors connecting the load across an input circuit which has one neutral side upon the occurrence of an imbalance in the currents flowing in the conductors. The circuit includes a differential transformer having a bifilar pair of windings wound on a toroidal core, the winding being connected in series with separate conductors of the input circuit. The permeability of the toroidal core of the transformer is quite low when the currents in the two conductors are equal or almost equal and increases greatly to decrease the inductance of a sensing winding, also wound about the core and energized with a pulsating current, upon the occurrence of an imbalance in the currents flowing in the two conductors. The circuit includes a transistor and SCR circuit responsive to the change in the inductance of the sensing winding for energizing the circuit breaker upon an increase in the inductance of the sensing winding to disconnect the load from



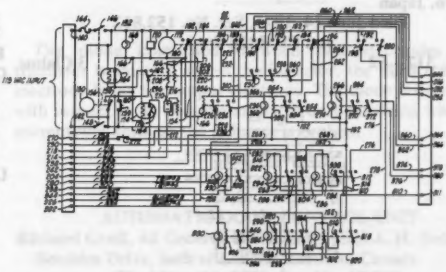
across the two conductors. The circuit may also include a check circuit for insuring that the windings of the differential transformer are properly connected across the input circuit.

3,662,219

APPARATUS FOR AUTOMATIC RELAY SYSTEM TESTING

Marion D. Knox, 2409 N.W. 115 Place, Oklahoma City, Okla.

Filed Mar. 16, 1970, Ser. No. 19,869
Int. Cl. G01r *15/12*; G08b *1/08*
U.S. Cl. 317—28 R **14 Claims**



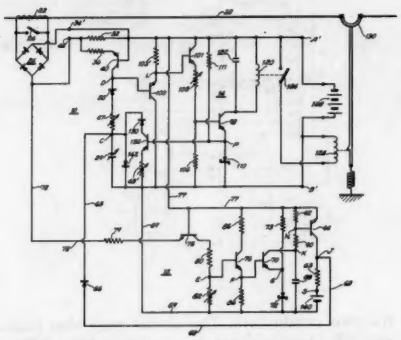
Apparatus for enabling check out and functional testing of directional comparison relaying circuitry in combination with transfer trip relaying circuitry having one or more channels in one or more directions, as may be located at one or more positions. The apparatus consists of periodically actuatable test units which provide a plurality of programmed outputs to effect transmission and reception tests of transfer trip channels as well as the proper operation and function of associated directional comparison relaying equipment. A master testing unit located at a first position initiates operation and functions with one or more slaved remote test units to key transmissions and verify received signals between all directional comparison channels. Thereafter, the test units block the respective receiver trip output if necessary, to verify that a guard signal is present and then it returns the indication over the directional comparison relaying equipment to the transfer-trip transmitter location, to command trip signals which are then verified for each channel.

3,662,220

TIME DELAY DEVICE

Richard E. Riebs, Hales Corners, Wis., assignor to McGraw-Edison Company, Milwaukee, Wis.

Filed Mar. 19, 1959, Ser. No. 800,567
Int. Cl. H01h 47/18
U.S. Cl. 317—36 TD 28 Claims



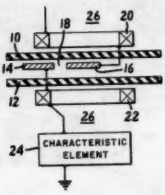
This invention relates to time delay devices and more particularly to electronic time delay devices that have particular but not exclusive application as a time delay means for repeating circuit interrupters or reclosers.

3,662,221

ELECTRIC APPARATUS

Naoya Yamada, Yao, and Shoji Tada, Nishinomiya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 14, 1971, Ser. No. 152,812
Int. Cl. H02h 9/06
U.S. Cl. 317—62 3 Claims



A lightning arrester is disclosed including a volume of electrically negative fluid and a pair of spaced arc-extinguishing plates formed of a copolymer of acetal including —C—C— bonds.

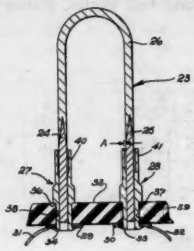
3,662,222

ELECTRIC RESISTANCE WIRE IGNITER WITH A COOLING TERMINAL POSTS CONSTRUCTION

William A. Ray, North Hollywood, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 7, 1970, Ser. No. 35,396
Int. Cl. F23g 7/10
U.S. Cl. 317—98 1 Claim

A resistance wire igniter for a pilot light of a gas fuel burning apparatus including an electric current heated filament having molybdenum and portions tapered toward and fixed with a molybdenum disilicide central portion. Terminal posts



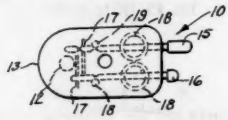
construction for keeping the filament ends cool so that they will not oxidize.

3,662,223

PRE-AMPLIFIER PLUG FOR MUSICAL INSTRUMENTS WITH BATTERY RETAINING AND SWITCH ACTIVATING ROD MEANS

Walter L. Marshall, P.O. Box 105, West Burlington, Iowa

Filed July 2, 1971, Ser. No. 159,434
Int. Cl. H02b 1/10; H03f 1/00
U.S. Cl. 317—99 3 Claims



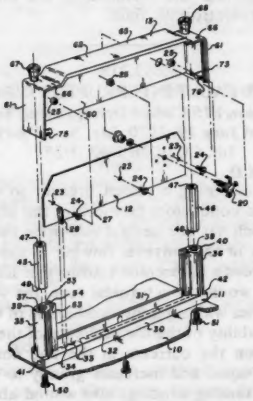
A plug with a self-contained solid state preamplifier primarily for musical instruments. This device includes resisters, capacitors and battery means, coupled to pre-amplify input signals to conventional amplifiers.

3,662,224

HOLDER FOR ELECTRICAL MODULES WITH CASING ENCLOSING AND CARRYING PRINTED CIRCUIT CARD

Gerhard J. Rauch, Burnaby, British Columbia, Canada, assignor to Cascade Electronics Ltd., Port Moody, British Columbia, Canada

Filed June 22, 1970, Ser. No. 48,266
Int. Cl. H05k 5/02, 7/14
U.S. Cl. 317—101 DH 5 Claims



A module and module guide particularly but not necessarily exclusively for cable television amplifiers in which the

guide includes means by which it may be secured to a chassis board and means by which a casing for the module may be secured to the guide.

3,662,225

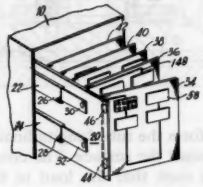
MULTI-PRINTED CIRCUIT ASSEMBLY

Robert W. Carter, Bayonne; Steve Chichanowski, and Frances Chichanowski, both of Dayton, all of N.J., assignors to Qicsys Systems, Inc., Dayton, N.J.

Filed Jan. 9, 1970, Ser. No. 1,615

Int. Cl. H02k *7/16;* **H05k** *11/14*

U.S. Cl. 317—118 **2 Claims**



An electronic system modular assembly. A plurality of printed circuit boards including sockets for integrated circuits are mounted on a plurality of support boards which are slidably connected to a housing. Modules are formed of individual of groups of printed circuit boards or by complete support boards. Access to any module is achieved by sliding the support boards out from the housing.

3,662,226

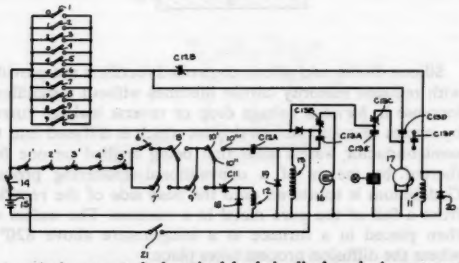
SEQUENTIALLY CODED ELECTRICAL LOCKING MEANS

William Tonkowich; John A. Meditz, both of Franklin Lakes, and Paul Vignola, Succasunna, all of N.J., assignors to Safetech, Inc., Fairfield, N.J.

Filed Mar. 5, 1971, Ser. No. 121,413

Int. Cl. H01h *47/00;* **E05b** *49/00*

U.S. Cl. 317—134 **12 Claims**



A switch operated electrical lock is disclosed. A group of switches is provided, a number of which must be operated in an exact sequence to operate the lock. The operation of any single switch out of sequence requires all of the switches to be reset and the switching operation to be repeated.

3,662,227

CONTROL SYSTEMS

John J. Morrison, Disley, and John Morton, Hazel Grove, both of England, assignors to Cableform Limited, Cheshire, England

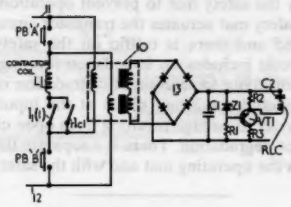
Filed Feb. 10, 1970, Ser. No. 10,198

Claims priority, application Great Britain, Feb. 13, 1969, 7,815/69

Int. Cl. H01h *47/00*

U.S. Cl. 317—135 **2 Claims**

An electrically operated machine has a bi-manual or double button control system which requires an operator to depress both buttons to institute operation, provision being made that both buttons have to be operated within a delay period thus preventing one or other button being wedged-on.



If operation of both buttons does not occur within the delay period the circuit is disabled and can only be re-enabled by releasing both buttons.

3,662,228

CIRCUIT ARRANGEMENT FOR GENERATING A SIGNAL AND FOR SUPPRESSING VOLTAGE PEAKS

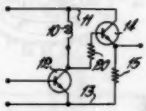
Karl-Ernst Boeters, Berlin; Gerhard Conzelmann, Leinfelden; Klaus Streit, Tuebingen, and Hans-Joachim Fleischer, Berlin, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 17, 1970, Ser. No. 55,881

Claims priority, application Germany, July 22, 1969, P 19 37 114.3

Int. Cl. H01h *47/32*

U.S. Cl. 317—148.5 R **9 Claims**



The diode comprised between two electrodes of a transistor is shunted across the inductor, the third transistor electrode being the output electrode. The diode is connected with respect to its polarity so that it only conducts when the current flow through the inductor is broken.

3,662,229

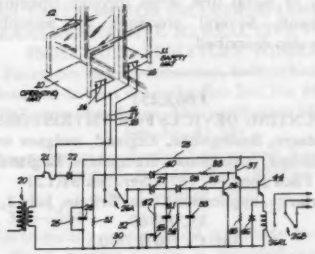
AUTOMATIC DOOR CONTROL UNIT

Richard Graff, 42 Godfrey Drive, and Svend A. H. Holm, 831 Bershire Drive, both of London, Ontario, Canada

Filed Dec. 14, 1970, Ser. No. 97,755

Int. Cl. H01h *47/32*

U.S. Cl. 317—148.5 R **3 Claims**



An automatic door control unit for connection to an operating mat and a safety mat to actuate the unit. The unit

includes an amplifier connected to the operating mat to provide a signal actuating a door operating relay, and the amplifier includes an input impedance forming a network decreasing sensitivity to operating mat degradation of resistance. A transistor circuit is connected across the amplifier unit and controlled by the safety mat to prevent operation of the amplifier. The safety mat actuates the transistor circuit when the door is closed and there is traffic on the safety mat. The transistor circuit includes an impedance forming a network decreasing sensitivity to safety mat degradation of resistance and further includes a Zener diode at the input thereof to provide a barrier to voltage resulting from open circuit safety mat resistance degradation. There is a separate time delay associated with the operating mat and with the safety mat.

3,662,230

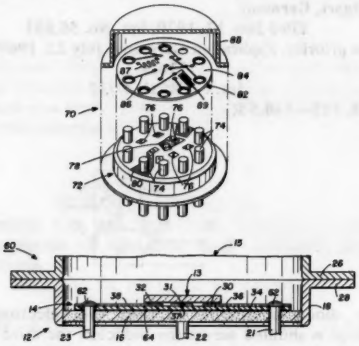
A SEMICONDUCTOR INTERCONNECTING SYSTEM USING CONDUCTIVE PATTERNS BONDED TO THIN FLEXIBLE INSULATING FILMS

James O. Redwantz, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 739,855, June 25, 1968, now abandoned. This application Nov. 30, 1970, Ser. No. 93,912

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **4 Claims**



A highly reliable, low cost packaging system for one or more semiconductor chips each having metal contact pads on at least one face. A rigid support is provided for the semiconductor chip and also the large leads which are used to connect the packaged device in an external circuit. A set of thin metallic film strips are bonded to a thin flexible dielectric sheet for support. The set of metal strips interconnects the contact pads on the semiconductor chips and selected leads to electrically interconnect the semiconductor device and the leads. Where a plurality of semiconductor devices are used, a plurality of dielectric sheets can be stacked and electrical connections made between the different layers of metal film strips through openings in the dielectric sheets. Several processes for assembling the packages are also described.

3,662,231

MOUNTING DEVICES FOR THYRISTORS

Ronald Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, Hampshire, England

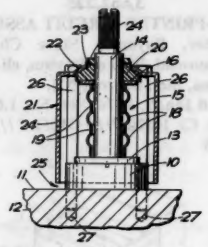
Filed June 30, 1970, Ser. No. 51,121

Claims priority, application Great Britain, July 2, 1969, 33,380/69

Int. Cl. H01l *3/00*

U.S. Cl. 317—234 R **9 Claims**

A mounting device for a thyristor comprising a longitudinally collapsible corrugated tube one end of which engages the thyristor when it is resting against a surface. A clamping structure engages the other end of the tube, and there are means to secure the clamping structure to the surface, which means are adjustable to urge the structure towards the surface so as to deform the tube longitudinally and thereby press the thyristor against the surface. The construction of the collapsible tube is such that the load in the tube, when it is deformed, is substantially independent of the extent of its deformation.



3,662,232

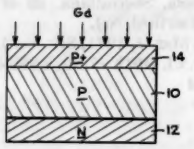
SEMICONDUCTOR DEVICES HAVING LOW MINORITY CARRIER LIFETIME AND PROCESS FOR PRODUCING SAME

Donald F. Stahr, Johnstown, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 10, 1970, Ser. No. 96,801

Int. Cl. H01l *7/02, 5/00*

U.S. Cl. 317—234 **11 Claims**



Silicon diodes and silicon controlled rectifiers are provided with reduced minority carrier lifetimes without a significant increase in forward voltage drop or reverse leakage current by means of a gadolinium dopant which is diffused into the semiconductor wafers after first being applied on one face thereof by means of a conventional sputtering process. Gadolinium is sputtered onto the base side of the rectifiers from a foil of the pure metal in a vacuum. The wafers are then placed in a furnace at a temperature above 820° C where the diffusion process takes place.

3,662,233

SEMICONDUCTOR AVALANCHE DIODE

Denis Clerc, Wettingen, and Dieter Zahn, Baden, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed June 16, 1969, Ser. No. 833,386

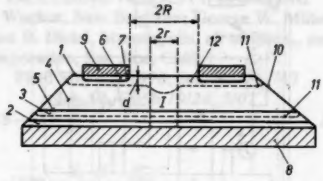
Claims priority, application Switzerland, July 22, 1968, 10977/68

Int. Cl. H01l *5/00*

U.S. Cl. 317—235 T **2 Claims**

A p+ p n n+ semiconductor diode comprises a disc of semiconductor material such as silicon with a bevelled edge, a carrier plate of molybdenum in contact with the outer, p+ zone and an axially centered annular electrode in contact with an annular n+ region of the n-doped zone. The radius of the opening within the annular electrode and the underlying

n+ region is greater than that of a central cylindrical region of the semiconductor material which has the minimum specific resistance of the overall disc material, and the annular region of the semiconductor material which lies between the central cylindrical region of lowest specific resistance and the inner boundary of the annular n+ region has a resistance characteristic such that when a current flows through such



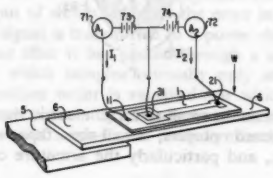
annular region at which no destruction of the semiconductor material yet occurs in the event of avalanche breakdown, the voltage drop which is produced is equal to the difference between the breakdown voltage in the central region of lowest resistance where avalanche breakdown is started and the means breakdown voltage in the remaining part of the semiconductor disc.

3,662,234

SEMICONDUCTOR ELECTROMECHANICAL TRANSDUCER ELEMENT HAVING A P-N-P OR N-P-N AMPLIFYING JUNCTION INTEGRALLY ASSOCIATED WITH A STRAIN-SENSITIVE REGION

Katsuyuki Ishii, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Oct. 30, 1970, Ser. No. 85,414
Claims priority, application Japan, Nov. 13, 1969, 44/90981
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **7 Claims**



A highly sensitive, stable output, electromechanical semiconductor transducer element is formed from a unitary body of a semiconductor material wherein three regions are formed to provide a strain-sensitive region and P-N junctions which can provide a high gain electrical output which is based on a piezoresistive effect produced in the strain-sensitive region which is amplified by the presence of P-N junctions.

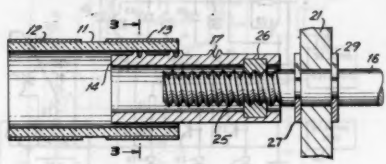
3,662,235

CO-AXIAL TUNING CAPACITOR DEVICES

Seymour Napolin, Westbury, N.Y., assignor to Melsey Corporation, Carle Place, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,000
Int. Cl. H01g *5/14*
U.S. Cl. 317—249 T **6 Claims**

A tunable capacitor for use in precision frequency tunable circuits having a tunable slug for movement within a dielectric tube with a capacitive outer surface, wherein protrusions such as dimples are distributed on the surface of the slug in



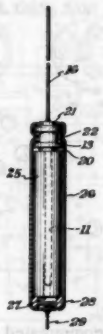
order to maintain a constant and evenly distributed air dielectric between the slug and the tube.

3,662,236

CAPACITOR IN A SEALED METAL CASE

Mark Markarian, Williamstown, and Robert J. McDonough, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 12, 1971, Ser. No. 123,722
Int. Cl. H01g *1/02*
U.S. Cl. 317—260 **7 Claims**



An integral rigid axial electrical connector extends from an electrode of a capacitance section through an insulating plug closure in the open end of a metal casing. The connector provides a fluid tight seal with the insulating plug and serves as the mandrel on which the capacitance section is rolled.

3,662,237

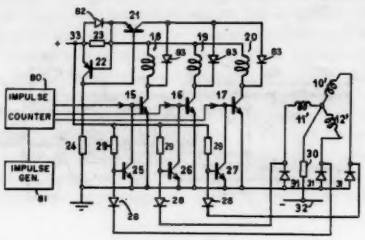
COMMUTATED MOTOR INCLUDING COMMUTATION MEANS RESPONSIVE TO REACTIVE VOLTAGE INDUCED IN ARMATURE WINDINGS

Robert Favre, Servan 36, Lausanne, Switzerland

Continuation-in-part of application Ser. No. 682,176, Nov. 13, 1967, now abandoned. This application May 28, 1970, Ser. No. 41,331
Claims priority, application Switzerland, Nov. 11, 1966, 16307/66; Dec. 16, 1966, 18207/66
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **12 Claims**

An electronically commutated polyphase motor operating from a direct current supply is provided with means for avoiding excessive short circuit current being produced in the motor windings by reactive voltage induced in the windings, for example under light load conditions.

Transistors in the commutating circuit are thereby protected from overload. Further safety means prevents malfunction



caused by reactive voltage induced in inductive coupling between the commutating circuit and a control circuit.

3,662,238

ELECTRONICALLY COMMUTATED MOTOR

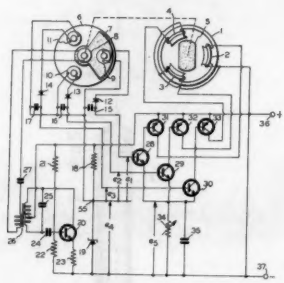
Kazutsugu Kobayashi; Hisayuki Matsumoto, and Yoshiaki Igarashi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd.

Filed May 20, 1969, Ser. No. 826,191

Claims priority, application Japan, May 21, 1968, 43/35220; May 22, 1968, 43/35252

Int. Cl. H02k *29/00*

U.S. Cl. 318—254 **5 Claims**



An electronically commutated motor and control means therefor.

The electronically commutated motor has no dead zone and no overlap despite an imperfect position detecting signal. The transition of the commutation is carried out in a differential manner. Any fluctuation in the operating temperature and/or deviation of the supply voltage does not disturb the commutation. The generating torque of the motor is easily controlled by a small power without using any additional power control means. A constant torque motor and a constant speed motor are illustrated.

3,662,239

STITCHING MACHINE WITH INERTIAL (DC) MOTOR FOR PULL ROLLS AND ELECTRONIC CONTROL THEREOF

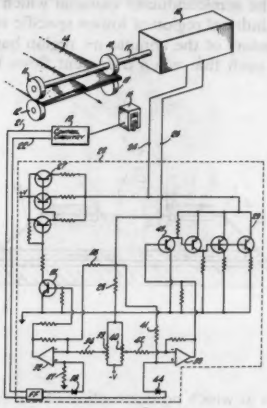
Keith Jefferts, Summit, N.J., assignor to Flynn & Emrich Company, Baltimore, Md.

Filed Feb. 1, 1971, Ser. No. 111,198

Int. Cl. B27f *7/22*

U.S. Cl. 318—270 **12 Claims**

An extremely simple, high speed stitching machine is disclosed which includes pull rollers for moving a workpiece to be stitched along a path adjacent to a stitching head, a DC motor for directly driving the pull rollers and control circuitry for coordinating the operation of the DC motor and stitching head. Additionally current limiting circuitry is provided for electronically controlling the acceleration and deceleration of the motor thereby limiting the torque which



will be applied by the rollers to the workpiece. In a preferred embodiment the extent of acceleration and deceleration (and the torque control) can be selectively varied in accordance with the strength of the media comprising the workpiece.

3,662,240

SMALL-SIZE DIRECT CURRENT MOTOR

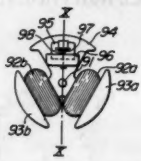
Toshio Yukisada, Daito; Takao Noma, Hirakata; Masanori Mirisawa, Moriguchi, and Osamu Hashimoto, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 21, 1970, Ser. No. 39,221

Claims priority, application Japan, May 28, 1969, 44/43032

Int. Cl. H02k *27/20*

U.S. Cl. 318—325 **5 Claims**



Improvements in small size DC electric motors for use in portable record players, small-size tape recorders, car stereos, etc., and particularly the armature construction of the motor.

3,662,241

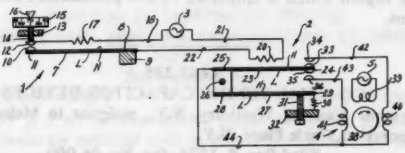
TRANSMITTER-RECEIVER SYSTEM

Russell P. Sweger, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Mar. 29, 1971, Ser. No. 128,890

Int. Cl. H02p *1/04*

U.S. Cl. 318—473 **11 Claims**



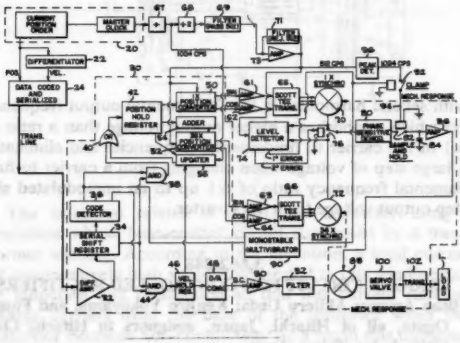
A transmitter-receiver system is based upon electrically heated bimetal contactors. The transmitter is percentage on timer that responds to a sensed condition, while the receiver

bimetal takes a position that is a function of the percentage on time. The heaters for both transmitter and receiver are connected in series so that fluctuations in supply voltage are compensated. Changes in ambient temperature at either transmitter or receiver or both may be compensated by means of compensating bimetals.

3,662,242
DIGITAL SERVO POWER DRIVE CONTROL INCLUDING VELOCITY UPDATING

Charles J. Wacker, New Brighton; George W. Miller, Anoka, and James B. Dietel, Minneapolis, all of Minn., assignors to FMC Corporation, San Jose, Calif.

Filed May 13, 1970, Ser. No. 36,747
Int. Cl. G05b *19/24, 5/01*
U.S. Cl. 318—573 **26 Claims**



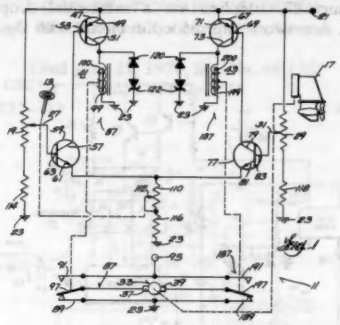
Digital signal orders are received at preset time intervals from a computer which signals indicate the desired angular position of a rotatably mounted load, such as a missile launcher mount. Velocity orders are derived from the position orders and both the velocity and position orders are converted to analog signals. A servomechanism is provided wherein the mechanical response of the load and the position signals provide continuous inputs for a synchro control transformer the output of which indicates the error in load position. The error signal is transmitted to a power drive system to drive the load after it has passed through a sample and hold controller which samples normally only at the time when a new position order is received but which may be operated to sample a plurality of times between position orders when an error of more than a predetermined amount is present.

3,662,243
ELECTRICAL CIRCUIT FOR STEERING AND THROTTLE CONTROL OF A MARINE PROPULSION DEVICE

David T. Cavil, Menomonee Falls; William R. Krueger, Milwaukee, and Henry J. Schmidt, Menomonee Falls, all of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 16, 1970, Ser. No. 89,792
Int. Cl. G05d *1/08;* **B63h** *25/02*
U.S. Cl. 318—588 **9 Claims**

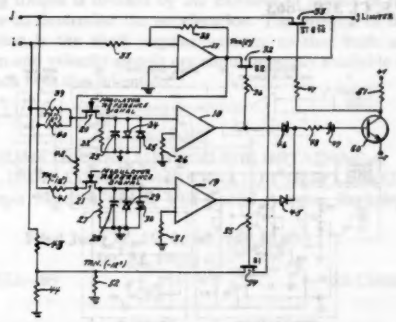
Disclosed herein is a steering control for the steerable unit of a marine propulsion device, such as a stern drive unit, which control includes a first potentiometer connected to a source of electrical current and having a first wiper connected to a steering wheel to afford variation in the potential at the first wiper in accordance with the steering wheel setting, together with a second potentiometer connected to the current source and including a second wiper connected to the steering unit to afford variation in the potential of the second wiper in accordance with the position of the steering unit, and transistorized switch means connected to the current source and to the wipers and selectively operable for causing movement of the steering wheel.



3,662,244
ELECTRONIC ANGLE LIMITING DEVICE FOR SERVO MECHANISM SYSTEM

Richard A. Day, Playa Del Rey; William E. French, and Michael A. Riley, both of Los Angeles, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 15, 1971, Ser. No. 153,311
Int. Cl. G05g *5/00*
U.S. Cl. 318—626 **1 Claim**



Angle limiting is achieved in a tangent servo system by modifying the sine input to the servo system. The product of the cosine input and the appropriate one of two constants representing the tangents of the maximum excursion angles is selected by control circuits and switched into the servo motor drive circuit when such maximum excursion is reached. An unmodified sine input is provided by the control circuits for normal operation between maximum excursion limits.

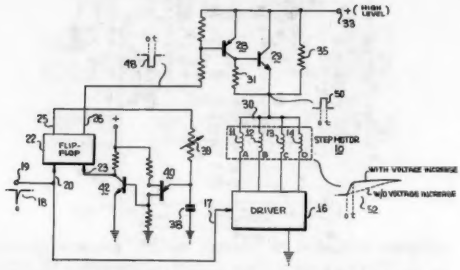
3,662,245
CONTROL CIRCUIT FOR ENERGIZING THE WINDINGS OF MULTI-PHASE STEP MOTORS INCLUDING A TWO LEVEL SUPPLY VOLTAGE

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Warner, N.H.

Filed Dec. 16, 1969, Ser. No. 885,552
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **12 Claims**

A control circuit for multi-phase step motors includes a driven circuit responsive to timed incoming pulses to excite the motor phases according to a predetermined switching

format. A power supply provides energization to the motor windings as the associated phases are excited, the energizing power normally supplied via a substantial dropping impedance. A network is provided in circuit with the dropping impedance to bypass that impedance and supply virtually the total power of the power supply to the windings associated with the excited motor phases, at selectable portions of the switching format.

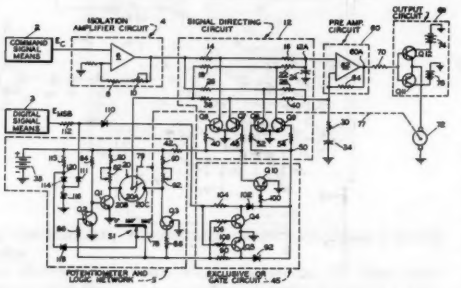


3,662,246

DIGITAL CONTINUOUS POTENTIOMETER SERVO FEEDBACK ELEMENT

Richard Cohen, Old Bridge; Harold Moreines, Springfield, and Walter Parfomak, Wallington, all of N.J., assignors to The Bendix Corporation

Filed Mar. 25, 1971, Ser. No. 127,908
Int. Cl. G05b *1/06*
U.S. Cl. 318—663 **9 Claims**



A servo system feedback element including a potentiometer in association with commutating and logic circuitry for providing a continuous and non-ambiguous saw-tooth follow-up output.

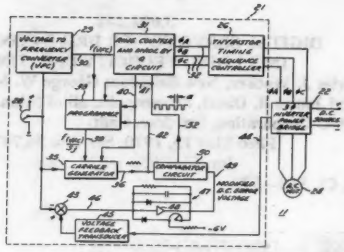
3,662,247

PULSE WIDTH MODULATED INVERTER ADAPTIVE LOGIC

Robert G. Schieman, Cleveland Heights, Ohio, assignor to Reliance Electric Company

Filed Oct. 1, 1970, Ser. No. 77,108
Int. Cl. H02m *1/12*, *7/52*; H02p *5/38*
U.S. Cl. 321—5 **40 Claims**

A pulse width modulated inverter is disclosed wherein adaptive logic is provided to control conduction of the switch means in the inverter. This logic controls the inverter switching rate and modulating pulse and notch width so that the power inverter section does not overheat because of a switching rate or fail because of a narrow modulating pulse. The adaptive logic is responsive to pulse width, notch width and a maximum or minimum carrier frequency all controlling the change of the ratio of carrier frequency to fundamental frequency. A three-phase system is described wherein the ratio of carrier to fundamental frequency is capable of being maintained at 3:1, which establishes a non-symmetrical wave with second harmonics in the fundamental output frequency yet which establishes a higher output voltage than a ratio of 6:1 of the carrier to fundamental frequencies and eliminates a large step of voltage when changing from a carrier to fundamental frequency ratio of 6:1 up to an unmodulated six-step output voltage from the inverter.

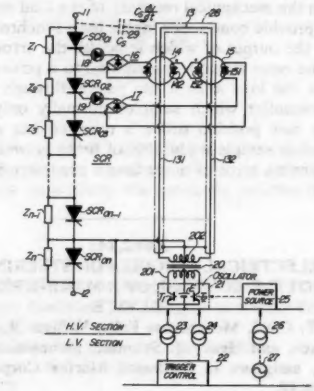


3,662,248

TRIGGER CIRCUIT FOR CONTROLLED RECTIFIERS

Hisao Amano; Akiteru Ueda; Kenjiro Yokoyama, and Fumio Ogata, all of Hitachi, Japan, assignors to Hitachi Ltd., Chiyoda-ku, Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,734
Claims priority, application Japan, July 25, 1969, 44/58342; 44/58343; Oct. 3, 1969, 44/78587
Int. Cl. H02m *7/24*; H03k *17/00*; H01f *27/28*
U.S. Cl. 321—11 **17 Claims**

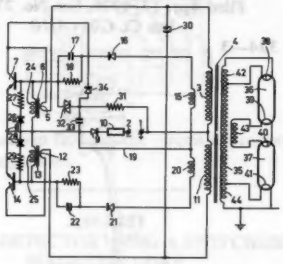


A trigger circuit for controlled rectifiers connected in series such as a converter in DC transmission systems. A trigger signal for controlled rectifiers is supplied from secondary windings which are disposed on an iron core together with a primary conductor in a current transformer system. Said primary conductor consists of a two-way circuit in which circulates a current for producing a trigger signal. Compensating windings are additionally disposed on said iron core, which combine with said two-way circuit of said primary conductor to prevent an erroneous trigger signal from being generated.

3,662,249
DC-AC CONVERTER

Dan Bernardus Wijsboom, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,401
Claims priority, application Netherlands, Sept. 18, 1969, 6914125
Int. Cl. H02m 1/18
U.S. Cl. 321—11 9 Claims

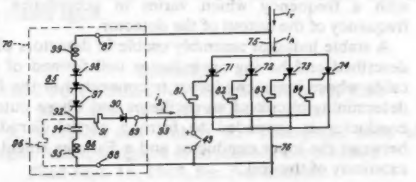


The invention relates to a DC-AC converter using a transistor whose base-emitter circuit is shunted by a transformer winding. According to the invention, a total current of comparatively high value is generated in this winding due to induction and conduction so that this current removes charge carriers from the base of the transistor when this transistor becomes non-conducting. As a result this transistor is quickly ready again for blocking a voltage across its main electrodes. The invention is especially important in the use of highly resistive transistors for a high voltage.

3,662,250
THYRISTOR OVERVOLTAGE PROTECTIVE CIRCUIT

Dante E. Piccone, Philadelphia, and Istvan Somos, Lansdowne, both of Pa., assignors to General Electric Company

Filed Nov. 12, 1970, Ser. No. 88,853
Int. Cl. H02m 1/18
U.S. Cl. 321—11 20 Claims

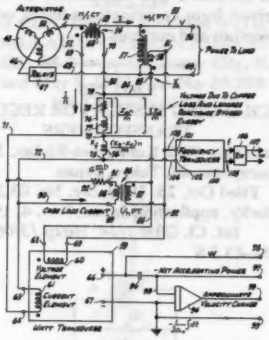


A high-power main thyristor is protected from forward voltage breakover by connecting in parallel relationship therewith an improved overvoltage responsive trigger scheme comprising at least one PNPN semiconductor element and a series L-C circuit. The PNPN element is connected between the anode and the gate of the main thyristor, and the L-C circuit is connected between the gate and the cathode. The element is selected to turn on in a voltage breakover mode when the forward bias voltage on the main thyristor attains a predetermined magnitude which is lower than the breakover level of the thyristor, whereupon the latter is triggered by a sharp gate punch.

3,662,251
METHOD AND SYSTEM FOR MEASURING ACCELERATION AND VELOCITY

Otto Joseph Mitchell Smith, 612 Euclid Avenue, Berkeley, Calif.

Filed June 22, 1970, Ser. No. 48,130
Int. Cl. H02p 9/38
U.S. Cl. 322—23 47 Claims

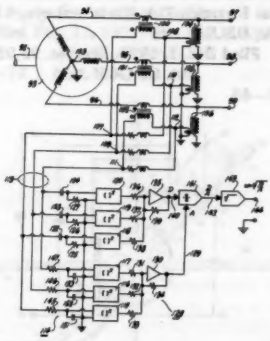


The acceleration of the shaft of a synchronous alternator is measured accurately with low noise by computing the power going into acceleration, which is the input shaft power plus the excitation power less the measured generator output less the computed losses. The accelerating power is divided by the speed to determine the accelerating torque. The accelerating torque is divided by the moment of inertia of the alternator to determine the acceleration. The integral of the acceleration is the shaft angular velocity so that both acceleration and velocity signals are simultaneously available in accordance with this invention.

3,662,252
TACHOMETER AND METHOD FOR OBTAINING A SIGNAL INDICATIVE OF ALTERNATOR SHAFT SPEED

Otto Joseph Mitchell Smith, 612 Euclid Avenue, Berkeley, Calif.

Filed June 22, 1970, Ser. No. 48,075
Int. Cl. H02p 9/00
U.S. Cl. 322—89 25 Claims



An improved tachometer which includes an alternator connected to a shaft whose speed is to be measured and which generates an alternating voltage. Electrical circuits perform a non-linear operation on the generated alternating voltage and produce a unidirectional output proportional to the speed of

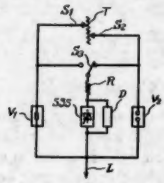
the shaft by order-independent iterative pairwise binary operations. One embodiment of electrical apparatus for performing such operations is a sine wave generator followed by square law operations on the generated voltages followed by an operational summer. Another embodiment includes a square wave generator followed by bridge rectification of the square waves to produce a unidirectional signal followed by a star or tree of diodes to produce an auctioneering circuit which passes the largest rectified voltage. Another embodiment of this invention is a tachometer in which a velocity signal is derived from computations based on the alternator terminal potentials and currents.

3,662,253

TAP CHANGING SYSTEM FOR REGULATING TRANSFORMERS

Saburo Yamamoto, 90-2 Kumegawa-Kodan, 1-4 Misumi-cho, Higashimurayama-shi, Tokyo, Japan

Filed Oct. 23, 1970, Ser. No. 83,383
Claims priority, application Japan, Nov. 4, 1969, 44/88266
Int. Cl. G05f 1/14; H02p 13/06
U.S. Cl. 323—43.5 S **4 Claims**



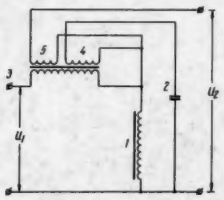
A tap changing system for regulating transformers disclosed here is of one resistor type in which vacuum switches are used for its main arcing contacts and a semiconductor switch or a semiconductor controlled switch bidirectionally conductive on AC is used in series to a current limiting resistor circuit which is switchably connected in parallel to said vacuum switches. Tap changing of one resistor method is effected by on-off operation of the vacuum switches, whereby on-off operation of the semiconductor switch is automatically effected.

3,662,254

FERRORESONANCE VOLTAGE STABILIZER

Alexandr Fedorovich Gorbuntsov, Kremlevskaya, 4, kv. 3; Efim Petrovich Berlinblau, ulitsa Schastlivaya, 7, kv. 89, and Nikolai Kuzmich Pul, Kremlevskaya, 63, kv. 20, all of Zaporozhie, U.S.S.R.

Filed Dec. 1, 1970, Ser. No. 93,954
Int. Cl. G05f 3/06
U.S. Cl. 323—45 **2 Claims**



A ferroresonance voltage stabilizer for stabilizing a power supply voltage by minimizing voltage variations in an output circuit thereof, of the type having a saturable transformer winding in series with a linear choke, a compensating winding connected in series with an output circuit and a capacitor making a ferroresonant circuit with the transformer winding, in which an additional compensating winding is provided in series with the capacitor to compensate variations of voltage in the capacitor circuit, thereby to get a well regulated and stabilized output voltage.

3,662,255

APPARATUS FOR LOCATING CONCEALED OR BURIED METAL BODIES AND A STABLE INDUCTOR USABLE IN SUCH DETECTORS

Charles L. Garrett, 1201 Ravina Drive, Garland, Tex.

Filed Apr. 13, 1970, Ser. No. 27,575
Int. Cl. G01v 3/10
U.S. Cl. 324—3 **12 Claims**

A metal detector for locating metal bodies buried in the ground or embedded in other structures having a probe assembly which is movable parallel to the surface of the earth or such structure and whose inductance varies as the inductor assembly is moved into the proximity of such concealed object, the detector providing an output signal whose frequency varies in accordance with the inductance of the probe assembly, wherein the probe assembly includes large diameter and small diameter inductor assemblies selectively connectible in a frequency determining circuit of an oscillator and wherein the signal produced by the detector may be indicated visually by means of a meter, audibly by a speaker to which the output of the detector is transmitted, or by neon bulbs mounted on the inductor assemblies which light up with a frequency which varies in accordance with the frequency of the output of the detector.

A stable inductor assembly usable in detectors of the type described and having an inductor coil formed of a coaxial cable whose inner conductor is connected in the frequency determining circuit of an oscillator and whose outer coaxial conductor is grounded to form a partial Faraday shield between the inner conductor and a Faraday shield mounted exteriorly of the coil.

3,662,256

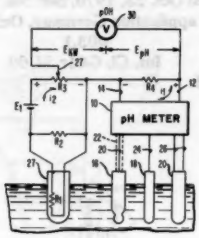
HYDROXYL ION MEASURING SYSTEM

Edgar L. Eckfeldt, Ambler, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Apr. 27, 1970, Ser. No. 31,900
Int. Cl. G01n 27/42
U.S. Cl. 324—29 **11 Claims**

A system for measuring the pOH value of a solution by subtracting a signal representing the pH value of the solution from a signal representing the value of the logarithm of the reciprocal of the ionization constant of water at the solution temperature. The circuit for providing the value of the logarithm utilizes a temperature sensitive resistive element

having a positive temperature coefficient. That element is shunted by a fixed resistor and the shunt combination is in series with another fixed resistor and a source of fixed potential so that the current through the circuit is proportional to the value of the logarithm.

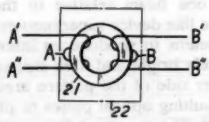


3,662,257

POSITION DETECTOR USING A SWITCHABLE MAGNETIC CORE

Nobutsune Fujiwara, Chiba-shi, Japan, assignor to Fujisash Industries, Ltd., Kanagawa, Japan

Filed Sept. 8, 1969, Ser. No. 855,980
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 PS **5 Claims**



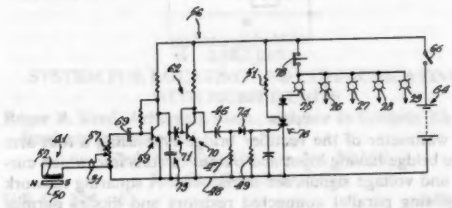
A position detector using a switchable magnetic core comprising a permanent magnet and a detector comprising a ring magnetic core having a primary coil adapted to be energized by a pulsed current and a secondary coil from which a signal is adapted to be taken out to an indicating means. Residual induction of the core is to be disturbed by relative motion of the permanent magnet to the detector. The disturbance is sensed by the indicating means so as to detect the relative motion. The source of the pulsed current and the indicating means may be disconnected from the detector acted on by the permanent magnet and the information may be obtained afterwards by connecting the source of pulsed current and indicating means again.

3,662,258

DEVICE FOR LOCATING NAILS BENEATH THE SURFACE OF A BOWLING LANE

Patrick J. Murphy, and Robert C. Thompson, both of Muskegon, Mich., assignors to Brunswick Corporation

Filed Sept. 16, 1969, Ser. No. 858,485
Int. Cl. G01r *33/00*
U.S. Cl. 324—41 **1 Claim**



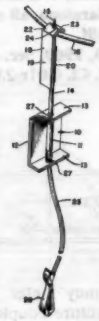
A nail locator for determining the location of nails close to the surface of a bowling lane including a base with a plurality of overlapping magnetic detectors mounted thereon with each of the detectors consisting of a permanent magnet and a coil potted in epoxy and arranged to induce a current in an input circuit upon relative movement of a sufficiently close nail, there being provided a plurality of detecting circuits each responsive to one of the magnetic detector input circuits and visual indicating lamps on a panel of the locator positioned to identify the approximate location of the nail.

3,662,259

CIRCUIT CONTINUITY TESTER WITH WIRE INSULATION PIERCING MEANS

August A. Dapilito, 55 Bowers St., Jersey City, N.J.

Filed May 8, 1970, Ser. No. 35,790
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **1 Claim**



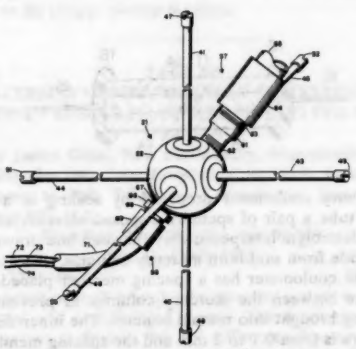
A circuit continuity tester for automotive circuits and the like features a simplified wire stabilizing and piercing means which prevents the wire from shifting as the pointed piercing element enters the same. The point of the piercing element is protected. A long bearing contact surface is provided between the piercing rod and the wire stabilizer. The structure is simplified, durable and economical.

3,662,260

ELECTRIC FIELD MEASURING INSTRUMENT WITH PROBE FOR SENSING THREE ORTHOGONAL COMPONENTS

Aubrey M. Thomas, and Aubrey G. Holston, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 12, 1971, Ser. No. 114,921
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **10 Claims**



An instrument is disclosed which includes a probe for sensing the *x*, *y*, and *z* orthogonal components of an electric

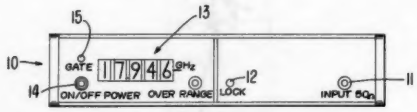
field occurring at any given place in an environmental medium and for producing a trio of analog signals proportional thereto. A computer is connected to said probe for the processing and resolving of said analog signals in such manner as to cause an output signal to be produced thereby that is proportional to the magnitude of the resultant thereof. Further computer structure is optionally employed to make computations and produce signals that are proportional to the vector quantity of the aforesaid resultant with respect to a given reference, as well as the angles thereof relative to the *x*, *y*, and *z* axes which are coincident with the aforesaid sensed electric field *x*, *y*, and *z* orthogonal components. Any or all of said signals are read out in terms warranted by any given operational circumstances.

3,662,261

AUTOMATIC FREQUENCY METER

Roy R. Barthold, Los Altos; William J. Keane, San Jose, and Lawrence F. Miller, Saratoga, all of Calif., assignors to EIP Labs, Santa Clara, Calif.

Filed June 3, 1969, Ser. No. 829,899
Int. Cl. G01r *23/02*
U.S. Cl. 324—78 R **5 Claims**



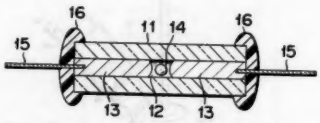
An automatic frequency meter is disclosed including a resonant frequency structure coupled to a transmission line with the frequency of the resonant structure continuously swept and change in level of the signal on the transmission line detected for a determination of the resonant frequency of the structure and therefore the frequency of the signal. The resonant frequency structure can be YIG coupled to the transmission line in an absorbtion mode. The YIG can be coupled to the line by positioning adjacent a slot in the center conductor with the slot aligned parallel to the magnetic field for coupling to the 210 mode or perpendicular to the magnetic field for coupling to the 110 mode of the YIG.

3,662,262

MERCURY COULOMETER HAVING AN ELECTRODE SPACER

Hiroshi Shimizu, Shizuoka-ken, Japan, assignor to Terumo Ceramics Co., Ltd., Shizuoka-ken, Japan

Filed Oct. 20, 1970, Ser. No. 82,261
Claims priority, application Japan, Nov. 13, 1969, 44/107165
Int. Cl. G01r *27/22*
U.S. Cl. 324—94 **10 Claims**



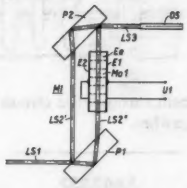
A mercury coulometer prepared by sealing in a bored capillary tube a pair of spatially disposed mercury columns with an electrolyte interposed therebetween and drawing out an electrode from said both mercury columns, characterized in that the coulometer has a spacing member placed in the electrolyte between the mercury columns to prevent them from being brought into mutual contact. The inner diameter of the bore is from 0.1 to 2 mm and the spacing member has a dimension of about 80 – 90 percent of the inner diameter of the bore in the direction of the diameter of the bore.

3,662,263

APPARATUS FOR MEASURING CURRENT IN HIGH-VOLTAGE LINES

Joachim Bensel, Steinau, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Oct. 28, 1970, Ser. No. 84,636
Claims priority, application Germany, Oct. 30, 1969, P 19 55 403.1
Int. Cl. G01r *31/00*
U.S. Cl. 324—96 **14 Claims**



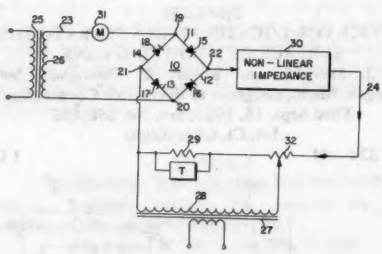
An apparatus for measuring the current flowing through a high-voltage line and transferring the result to a low-potential locality has at the high line-voltage side a magnetic or electric field which varies in dependence upon the current to be measured. An optical modulator controlled by the field variations is interposed in one of two beams of coherent light to modulate this one beam relative to the other. An interferometer or the like device superimposes the modulated and unmodulated beams to produce an interference fringe pattern of alternately bright and dark stripes which travel from one to the other side of the pattern area. Light conductors transmit the resulting optical pulses to photoelectric sensors on low potential. The corresponding electric pulses control a device for counting the interference stripes. At any time the count corresponds to the then obtaining intensity value of the current.

3,662,264

RECTIFIER BRIDGE TYPE WATTMETER

Clarence Wilson Hewlett, Jr, Hampton, N.H., assignor to General Electric Company

Filed June 26, 1969, Ser. No. 836,717
Int. Cl. G01r *7/00, 21/00*
U.S. Cl. 324—142 **7 Claims**

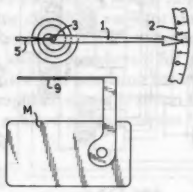


A wattmeter of the rectifier bridge type using a four-arm diode bridge having input and output circuits into which current and voltage signals are introduced. A squaring network comprising parallel connected resistors and diodes permits the product of the voltage and current signals to be read out by a milliammeter in the input circuit.

3,662,265
COMBINED MOTOR AND VOLTMETER

Serge Besancenot, 5 rue Edouard Sylvestre, Sevran (Seine-St.-Denis), France

Filed Nov. 7, 1969, Ser. No. 875,181
Int. Cl. G01r 1/20
U.S. Cl. 324—157 **1 Claim**

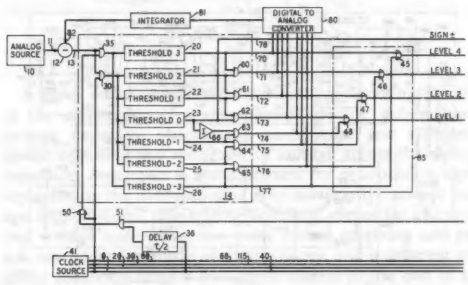


A voltmeter associated with a motor is operated by the magnetic field produced by the motor. A metal sensitizing element which is adjustable controls the sensitivity of the meter to the field.

3,662,266
NONLINEARLY SAMPLED DIFFERENTIAL QUANTIZER FOR VARIABLE LENGTH ENCODING

John Ormond Limb, New Shrewsbury, and Frank William Mounts, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 18, 1970, Ser. No. 38,317
Int. Cl. H04b 1/66
U.S. Cl. 325—38 B **3 Claims**



A differential quantizer for predictive PCM transmission systems in which difference signals are quantized at the Nyquist rate when they are below a predetermined level but are quantized at twice the Nyquist rate when they exceed that level. The difference signals are encoded for transmission but an extra bit follows each code word representing a level above the predetermined threshold to indicate to the receiver whether that sample is to be inserted by the receiver at a Nyquist interval or one-half a Nyquist interval from the preceding sample. Where the difference signal to be encoded is large due to a substantial change in the input signal, several such samples taken at twice the Nyquist rate serve to rapidly reduce the difference signal and provide a better approximation of the input signal to the receiver.

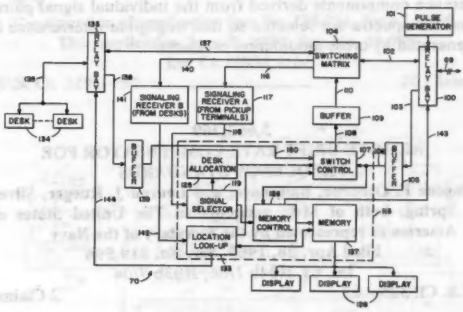
3,662,267
SYSTEM FOR LOCATING AND COMMUNICATING WITH MOBILE UNITS

Roger R. Reed, Arlington, Mass., assignor to Sylvania Electric Products Incorporated

Filed May 20, 1970, Ser. No. 39,100
Int. Cl. H04b 3/60, 7/00
U.S. Cl. 325—53 **8 Claims**

System for posting the location of each of a plurality of mobile units, for example, police cars, at a central office. The geographic area under the surveillance of the central office is divided into sectors. Each sector has a fixed pickup terminal which radiates a carrier frequency. Five different carrier frequencies are used so that each pickup terminal radiates at a frequency different from those radiated in contiguous sectors.

When a mobile unit moves from one sector to another sector, it senses that the strongest carrier frequency present is that being radiated from the pickup terminal in its new sector. The mobile unit transmits its unique identification coded signal on the one of five companion carrier frequencies which corresponds to the carrier frequency radiated by the pickup terminal of the new sector. Only pickup terminals radiating a carrier frequency of the frequency of the pickup terminal in the new sector and tuned to receive the companion carrier frequency with the identification coded signal, and its strength is such that it is detected only by the pickup terminal in the new sector.



The pickup terminal detects the identification coded signal and transfers it over connecting wires to the central office. The central office determines the particular mobile unit by the identification coded signal and determines its location by the particular connecting wires over which the signal is received. This data is stored in a memory at the central office, and is updated each time the mobile unit leaves one sector and enters a new sector.

The system may also provide for two-way voice communication between each mobile unit and the one of several control desks at the central office to which it is assigned. Communications between a mobile unit and the pickup terminal of the sector in which it is located is by radio employing the two carrier frequencies associated with the sector. Communication from the pickup terminal to the central office is by connecting wires. When a control desk initiates a call to a particular mobile unit, the memory is searched to determine the location of the mobile unit and the control desk is connected to the proper pickup terminal.

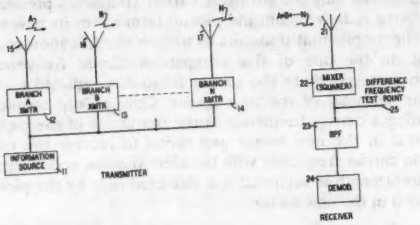
3,662,268
DIVERSITY COMMUNICATION SYSTEM USING DISTINCT SPECTRAL ARRANGEMENTS FOR EACH BRANCH

Michael James Gans, New Shrewsbury, Monmouth County, and Douglas Otto John Reudink, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 17, 1970, Ser. No. 90,396
Int. Cl. H04b 1/02
U.S. Cl. 325—56 **17 Claims**

The output of each branch of a diversity system contains a pilot signal and a modulated carrier. The spectrum of each branch output is distinct, but the difference frequency component between the signal and pilot is identical for all branches. The same intelligence is applied to each branch. In

a unitary branch combiner, a single mixer performs all cophasing and combining. All of the pilot and carrier signals are beat together to produce in-phase addition of the difference components derived from the individual signal pairs, and the spectra are selected so that negligible interference is generated by cross modulation products.

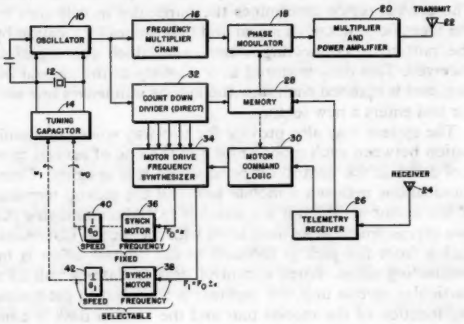


3,662,269

REMOTE DRIFT RATE COMPENSATOR FOR FREQUENCY STANDARDS

Eugene F. Osborne, Baltimore, and Lauren J. Rueger, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 28, 1969, Ser. No. 819,596
Int. Cl. H04b *1/66*; H03b *3/04*
U.S. Cl. 325—63 **2 Claims**



A drift rate compensator for secondary frequency standards of the quartz crystal type, which provides adjustment by remote control for long term rate of frequency change. Invention is particularly useful for maintaining the frequency stability of the oscillator in an orbiting satellite.

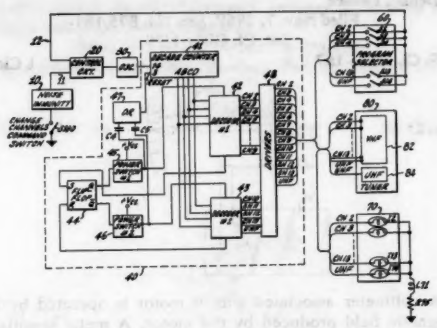
3,662,270

VHF/UHF INTERLOCK CIRCUIT

Wayne Wheeler Evans, Indianapolis, Ind., assignor to RCA Corporation

Filed July 16, 1969, Ser. No. 842,179
Int. Cl. H04b *1/16*
U.S. Cl. 325—390 **8 Claims**

In a television receiver having an electronically controlled tuner, a circuit for automatically tuning the receiver to a particular one of the channels, when, for any reason, the electronic tuning system is disconnected from the receiver.

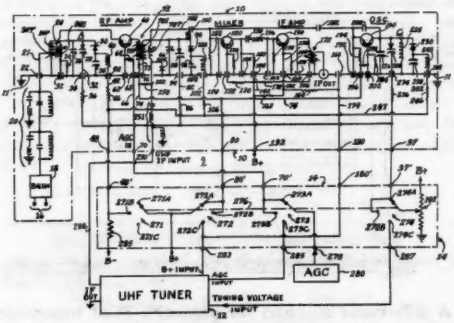


3,662,271

SOLID STATE TELEVISION TUNER

Mutsuo Nakanishi, Villa Park, Ill., assignor to Standard Kollsman Industries, Inc., Melrose Park, Ill.

Filed July 7, 1969, Ser. No. 839,168
Int. Cl. H04b *1/16*; H03j *5/00*
U.S. Cl. 325—459 **15 Claims**



A UHF-VHF all channel television tuning system including a solid state voltage-variable capacitor (varactor) tuned VHF television tuner in five embodiments is disclosed. The first VHF tuner is a three matched tuned circuit tuner including one varactor tuned preselector circuit, one varactor tuned RF amplifier load circuit and one varactor tuned oscillator circuit. Each of the three varactors of the three tuned circuits are controlled from a single voltage source and each of the tuned circuits has provisions for solid state switching between the lower and upper VHF bands so that the same voltage source can tune both VHF bands.

The VHF tuner includes four stages: a first RF amplifier stage, an IF amplifier stage, a mixer stage and an oscillator stage. Provisions are made for employing the IF amplifier stage and the mixer stage as cascaded IF amplifier stages when receiving a UHF television signal, with the same IF output terminal yielding signal outputs for both UHF and VHF modes of operation. Provision is also made for automatically alternating the gain of the cascaded amplifiers between the UHF and VHF modes to obtain a parity between the modulated IF outputs in both modes.

Also disclosed are four alternative embodiments of the VHF tuner of the invention; one in which two inductively coupled IF filter circuits are provided between the mixer

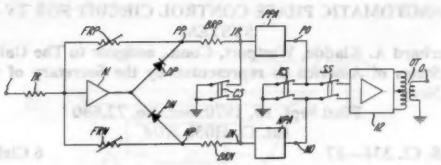
stage and the amplifier stage to reduce noise and cross-modulation, a second in which a field effect transistor (FET) is provided as the IF amplifier stages amplifying device for the same end and a third which is a three circuit three stage VHF tuner without provision for UHF signal accommodation. The fifth embodiment is a four tuned circuit VHF tuner capable of use in the system, which tuner includes a varactor tuned preselector circuit, a varactor double tuned interstage circuit and an oscillator varactor tuner circuit as well as IF amplifier stage that is employed for both UHF and VHF modes of operation and provision for altering the gain of the mixer and IF amplifier stages between UHF and VHF modes of operation to achieve parity between UHF and VHF IF outputs.

3,662,272

ELECTRONIC APPARATUS

Reginald C. Bolt, London, England, assignor to Molins Machine Company Limited, London, England

Filed Aug. 18, 1969, Ser. No. 851,016
Claims priority, application Great Britain, Aug. 22, 1968, 40,309/68
Int. Cl. G01r *5/22*
U.S. Cl. 328—104 **9 Claims**



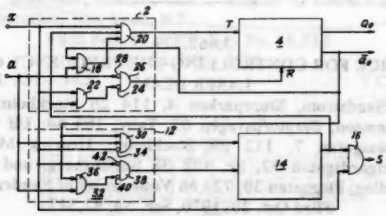
A pulse adder, producing an output representing the sum of the amplitudes of a sequence of electric pulses, has a storage capacitor charged by each pulse and stabilizing means opposing any reduction of voltage across the storage capacitor. Apparatus is also disclosed for producing a signal representing the average value of continuously-variable voltage over a period, comprising switching means for chopping said voltage into pulses, two pulse adders receiving said pulses, one adder for pulses of each polarjty, and a different amplifier receiving outputs from both adders at the end of the period and producing a signal representing the difference of the adder outputs, i.e. the aforesaid average value.

3,662,273

APPARATUS FOR SAMPLING RAMDOM PULSE

Armand Chicheportiche, Orsay; Rene Louis Vallee, Chilly-Mazarin, and Pierre Vergez, Massy, all of France, assignors to Commissariat A l'Energie Atomique, Paris, France

Filed June 24, 1970, Ser. No. 49,426
Claims priority, application France, July 7, 1969, 6922984
Int. Cl. H03k *17/00*
U.S. Cl. 328—151 **4 Claims**



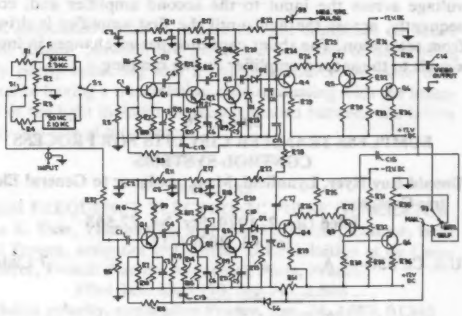
An apparatus for sampling a train I_e of pulses of random duration and position wherein, the sampling operation being controlled by the pulses of a second train I_o of pulses of the same type, the pulses of both trains excite a combinational device which in turn drives the reset and set inputs of a flip-flop unit having four stable states of equilibrium the pulses of both trains also excite a second combinational device which drives one of the inputs of a bistable unit, the complement of the output quantity of the flip-flop unit is fed back to the input of the second combinational device, the output quantity of the bistable unit is fed back to the input of the first combinational device, and the output of the bistable unit as well as the first train of random pulses are applied respectively to the two inputs of an AND circuit which selects the sampled pulses.

3,662,274

DUAL-CHANNEL LOGARITHMIC AMPLIFIER

Donald A. Pritchard, Orange, and Aldan Duane Gomez, San Diego, both of Calif., assignors to Ametek, Inc., New York, N.Y.

Continuation of application Ser. No. 735,224, June 7, 1968. This application June 8, 1970, Ser. No. 48,799
Int. Cl. H03d *1/14*
U.S. Cl. 329—192 **20 Claims**



A dual-channel logarithmic amplifier for amplifying and detecting frequency components of an input signal comprising a plurality of frequency components and particularly for amplifying and detecting desired frequency components in the presence of high level, wide band noise. The inventive apparatus comprises a first amplifier means responsive only to a relatively narrow band of the frequency components comprising the input signal for amplifying desired frequency components in the narrow band and producing an output signal. Second amplifier means are provided responsive to a relatively wide band of the frequency components comprising the input signal including high level, wide band noise adjacent to the desired frequency components for amplifying the same. Negative feedback means are connected from the second amplifier means to the first amplifier means so as to reduce the input gain of the first amplifier means in response to the output from the second amplifier means. In this manner, the detection and amplification of small amplitude desired frequency components is made possible even in the presence of high level, wide band noise.

3,662,275

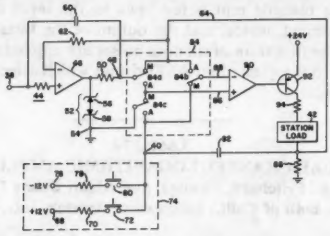
MANUAL/AUTOMATIC STATION FOR USE IN PROCESS CONTROL SYSTEMS

John E. Riley, Saugus, Mass., assignor to General Electric Company

Filed Oct. 1, 1970, Ser. No. 77,104
Int. Cl. H03f *1/34*
U.S. Cl. 330—1 A **6 Claims**

A manual/automatic station including two amplifiers and a switching circuit for interconnecting the amplifiers in either

an automatic configuration or a manual configuration. In the automatic configuration, the two amplifiers are in series. In the manual configuration, the output of a circuit associated with the first amplifier receives a feedback current from the station load circuit. A shunt capacitor connected between an input to the first amplifier and the circuit output charges to the difference between a feedback voltage developed in the station load circuit and an automatic control signal. The output of the first amplifier, which becomes saturated in the manual configuration, is limited by Zener diodes. On return to the automatic configuration, the Zener-limited voltage across the shunt capacitor. The current establishes a ramp voltage across the input to the second amplifier and, consequently, across the load until the first amplifier is driven from saturation. The shunt capacitor passes changes in input signals to the second amplifier during ramping.

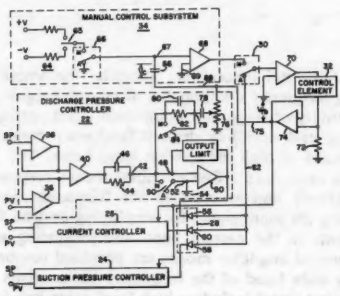


3,662,276

BUMPLESS TRANSFER CIRCUITS FOR PROCESS CONTROL SYSTEMS

Donald Roy Hyer, Lynnfield, Mass., assignor to General Electric Company

Filed Oct. 2, 1970, Ser. No. 77,563
Int. Cl. H03f 1/32
U.S. Cl. 330—1 A **7 Claims**



A process control system including automatic and manual control subsystems which alternatively regulate current supplied to a control element. The system includes means for providing bumpless transfer from one subsystem to the other. Memory capacitors in feedback paths to the subsystems store charges proportional to the voltage across the control element. The stored charges provide feedback bias to each amplifier in the subsystem to which control is being transferred.

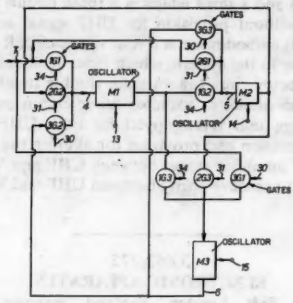
3,662,277

CLOCK OSCILLATOR ARRANGEMENTS

Colin Graham White, Chelmsford, England, assignor to The Marconi Company Limited, London, England

Filed Apr. 9, 1970, Ser. No. 27,012
Claims priority, application Great Britain, Apr. 14, 1969, 19,089/69
Int. Cl. H03b 3/04
U.S. Cl. 331—2 **6 Claims**

A clock oscillator arrangement including a plurality of at least three oscillator units so arranged that at any one time one of said oscillator units acts as a master oscillator unit controlling the remaining units, the arrangement being such that upon the occurrence of a phase fault between the unit for the time being acting as the master and one of the remaining units, the unit acting as the master is changed from said one to one of the other of the remaining oscillator units.

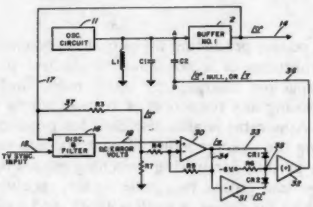


3,662,278

AUTOMATIC PHASE CONTROL CIRCUIT FOR TV SYSTEM

Gerhard A. Kladde, Westport, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 16, 1970, Ser. No. 72,680
Int. Cl. H03b 3/04
U.S. Cl. 331—17 **6 Claims**



An automatic phase control circuit to synchronize the frequency and phase of a TV system having a discriminator to produce an error signal from the discrimination of the TV sync signal frequency and the frequency from a reference local oscillator to develop, through buffer amplifiers and a unijunction negative resistance control source or through operational amplifiers and a varactor bridge, a zero phase signal, a null signal, or an out-of-phase signal to control the effective capacitive reactance of an L–C tank circuit coupled to control the reference local oscillator thus controlling the alternating current for the local oscillator thereby synchronizing its frequency and phase with the TV frequency and phase.

3,662,279

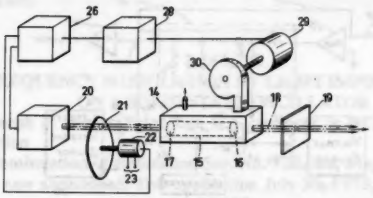
DEVICE FOR CONTROLLING THE FREQUENCY OF A LASER BEAM

Unto Sandstrom, Stureparken 4, 114 26 Stockholm; Nils Abramson, Bergtorpsvagen 62, Taby, 183 64; Ulf Sjolin, Celsiusgatan 7, 112 30 Stockholm; Henrick Murray, Tradgardsgatan 32, itr, 172 38 Sundbyberg, and Bertil Colding, Ploggatan 30, 724 66 Vasteras, all of Sweden

Filed Oct. 20, 1970, Ser. No. 82,347
Claims priority, application Sweden, Oct. 31, 1969, 14968/69
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 **14 Claims**

A system for stabilizing the frequency of a laser having the

resonator reflectors mounted on the ends of a gas discharge



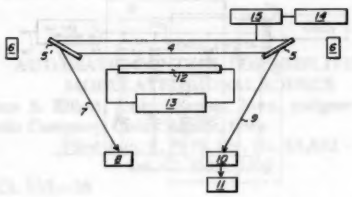
tube by controlling the temperature of the tube in response to an optical output signal from the laser.

3,662,280

EXPLOSIVELY DRIVEN PULSED CHEMICAL LASER

Reed J. Jensen, and Walter W. Rice, Jr., both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 16, 1970, Ser. No. 89,888
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **9 Claims**



Reactions of the type

$$QA_x \rightarrow Q + xA$$

$$A + BC \rightarrow AB^* + C$$

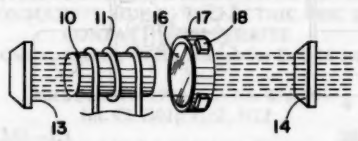
where Q, A, B and C are atoms, are driven by means of a very fast explosive reaction which does not produce the lasing molecule AB* but rather drives the lasing reaction by providing copious quantities of the atomic species A to undergo the lasing reaction. Provided that a sufficient distance in the binding energies of A's molecular precursor QA_x and BC exists, so that QA_x is selectively dissociated, intiation of a rapid explosive reaction in a gaseous branching chain explosive mixed with QA_x and BC produces an intense laser pulse chain in an optical cavity.

3,662,281

METHOD AND MEANS FOR COMPENSATING BIREFRINGENCE IN LASER SYSTEMS

Walter Koechner, Malibu, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,513
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **7 Claims**



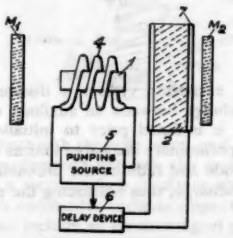
Birefringence induced by nonuniform heating in a laser rod is compensated for by introducing a compensating material of similar physical properties to the rod and artificially inducing birefringence in the compensating material in a sense opposite to that taking place in the laser rod.

3,662,282

STIMULATED EMISSION SOURCE OF LIGHT

Georges Bret, and Francois Gires, both of Paris, France, assignors to CSF-Compagnie General De Telegraphie Sans Fil

Continuation of application Ser. No. 441,094, Mar. 19, 1965. This application July 24, 1970, Ser. No. 58,159
Claims priority, application France, Mar. 20, 1964, 968037
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 **2 Claims**



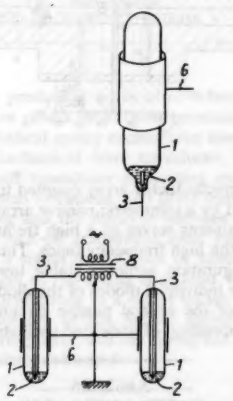
A stimulated emission source of light comprises an active body located between two mirrors, at least one of them being only partly reflecting and a pumping source. A plate of a material having a transmission ratio increasing with the intensity of the light incident thereon is placed between the active body and one of the mirrors.

3,662,283

HIGH FREQUENCY ELECTRONIC PULSE GENERATOR

Jean E. Usse, Villemonble, and Henri Spindler, Colmar, both of France, assignors to Centrale D'Exploitation et de Commerce, French (Societe Anonyme), Paris, France

Filed Jan. 13, 1970, Ser. No. 2,508
Claims priority, application France, Jan. 24, 1969, 01343
Int. Cl. H01s *1/04*
U.S. Cl. 331—94 **11 Claims**



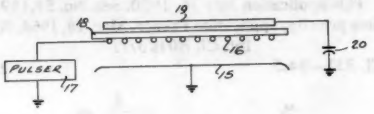
An electronic generator of very high voltage pulses at a very high frequency constituted by a tube enclosing a cathode fed with a very high voltage, said cathode being constituted by mercury in which a cathode spot is formed or else by gallium which melts at the temperature of operation while the tube is filled with the vapors of the cathode-forming metal. Said cathode, which is associated with an anode or otherwise, produces in an auxiliary conductive component located inside or outside the tube the desired high frequency pulses.

3,662,284

DOUBLE DISCHARGE LASER

Alexandre J. Beaulieu, and Albert Laflamme, both of Ste. Foy, Quebec, Canada, assignors to Her Majesty the Queen in right of Canada represented by the Minister of National Defence of Her Majesty's Canadian Government

Filed Aug. 20, 1970, Ser. No. 65,588
Claims priority, application Canada, Aug. 29, 1969, 60,715
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 4 Claims



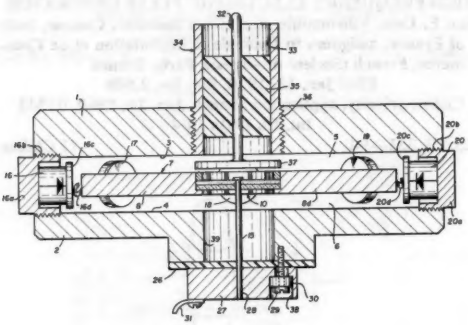
A transverse excitation system is disclosed in which a preliminary discharge between an auxiliary electrode and a main electrode is initiated prior to initiation of the main discharge. The preliminary discharge ionizes the gas adjacent the main electrode and reduces the probability of the onset of bright arc discharge, thus enhancing the efficiency of gas excitation.

3,662,285

MICROWAVE TRANSDUCER AND COUPLING NETWORK

Charles T. Rucker, Clearwater, Fla., assignor to Sperry Rand Corporation

Filed Dec. 1, 1970, Ser. No. 94,046
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R 11 Claims



An active semiconductor array coupled to high frequency fields supported by a symmetric passive array of radial transmission line elements serves as a high frequency transducer for amplifying the high frequency fields. The radial transmission line configuration achieves stable low-loss combining power from the individual diodes of the diode array and permits coupling of the several passive circuits to a common output with suppression of undesired oscillation modes.

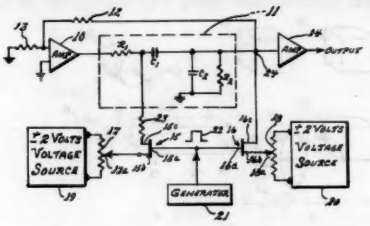
3,662,286

GATED OSCILLATOR

John Eugene Krupa, Morrestown, N.J., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 20, 1971, Ser. No. 107,962
Int. Cl. H03b 5/24
U.S. Cl. 331—108 2 Claims

A gated oscillator is provided which reproduces any part of or any number of sine wave cycles such as a cosine squared pulse, for example. The equation for the output may be expressed as $e_o = \sin(wt + \phi)$ where ϕ and t are determined by the gating. Since ϕ is the initial phase angle or amplitude of



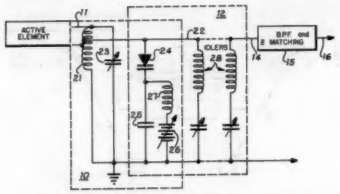
the sine wave and it determines the number of cycles, it is possible to start the sine wave at any angle from 0° to 360° and let it continue for any number of cycles.

3,662,287

VOLTAGE CONTROLLED OSCILLATOR MULTIPLIER

Harry F. Egbert, Port Hueneme, and James R. Falls, Jr., Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 24, 1971, Ser. No. 118,274
Int. Cl. H02m 5/20
U.S. Cl. 331—117 4 Claims



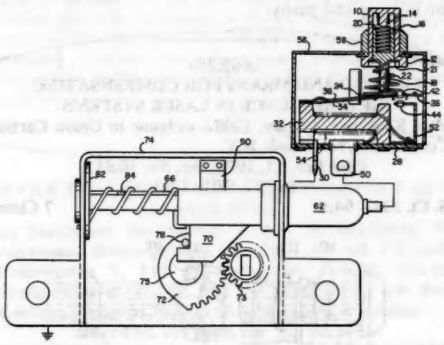
A voltage controlled oscillator and varactor multiplier circuit having a varactor network coupling the output of an oscillator through a band pass filter to an output in which a single varactor produces frequencies tuned by varying the bias thereon and produces frequency multiplication.

3,662,288

MAGNETIC SWITCH SYSTEM

Peter T. Carlson, Canton; Frederick J. Weremey, Milton, and Edward B. Mitchell, Belmont, all of Mass., assignors to TRW Inc., Cleveland, Ohio

Original application Sept. 12, 1968, Ser. No. 759,286. Divided and this application Apr. 21, 1970, Ser. No. 38,626
Int. Cl. H01h 50/30
U.S. Cl. 335—192 1 Claim



This is a magnetic switch in which a plunger urges a contact at the end of an armature against a fixed contact passing

a current through the winding around the core which causes a magnetic field to be formed around the core that holds the armature to the core until the circuit is broken by another means.

3,662,289

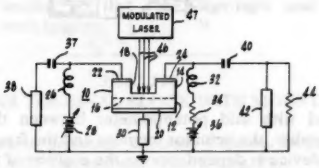
FREQUENCY MODULATION BY LIGHT IMPINGEMENT ON A SOLID STATE OSCILLATOR

Joseph F. Dienst, Princeton, N.J., assignor to RCA Corporation

Continuation of application Ser. No. 733,000, May 29, 1968, now abandoned. This application July 30, 1970, Ser. No. 64,112

Int. Cl. H03c *3/36, 3/38*

U.S. Cl. 332—3 **7 Claims**



Frequency modulation by varying the intensity of light impinging on a three terminal GaAs microwave oscillator.

3,662,290

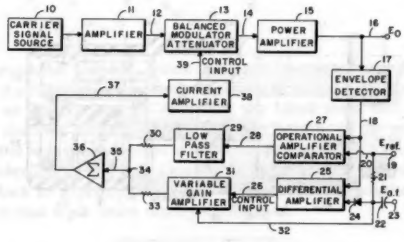
AUTOMATIC CONTROL FOR AMPLITUDE-MODULATED SIGNAL SOURCE

William S. Elliott, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Aug. 5, 1970, Ser. No. 61,132

Int. Cl. H03c *1/00*

U.S. Cl. 332—38 **6 Claims**



An automatic level control maintains an accurate output level measurement under conditions of high modulation index by developing a control signal proportional to the deviation of output level from a desired norm. Output level is determined as a function of the time that the modulation envelope thereof exceeds a predetermined threshold. The control is independent of distortions in recovered modulation envelope waveform introduced by conventional envelope detectors due to diode offset voltage and/or high modulation index and permits independent application of carrier level and modulation index controls.

3,662,291

WAVEGUIDE FERRITE CIRCULATOR HAVING CONDUCTIVE SIDE OF DIELECTRIC DISC IN CONTACT WITH FERRITE

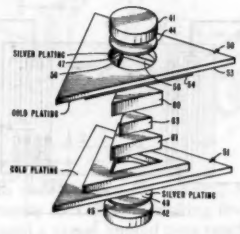
John J. Cotter, Agoura, Calif., assignor to E & M Laboratories

Filed June 19, 1970, Ser. No. 47,676

Int. Cl. H01p *1/32, 5/12*

U.S. Cl. 333—1.1 **20 Claims**

A high speed microwave device comprises a dielectric waveguide body with conductive interior surfaces, upper and lower triangular transition plates, upper and lower pole pieces extending through the top and bottom walls of the waveguide and partway through the upper and lower transition plates respectively, upper and lower thin dielectric discs within the upper and lower transition plates and in contact with the upper and lower pole pieces respectively, each of the discs having a conductive surface opposite the surface



which is in contact with the pole piece, and upper and lower ferrite elements disposed between the transition elements, each including a terminal face in planar abutment with the upper and lower conductive surfaces respectively. The circulator further may include an electromagnet providing rapidly changeable magnetic fields to operate at high switching speeds with excellent wave transmission characteristics but is readily manufactured and assembled.

3,662,292

HELICAL SPRING FOR PRODUCING ARTIFICIAL REVERBERATION

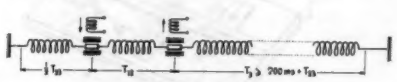
Werner Fidi, Baden Bei Wien, and Bernhard A. Weingartner, Wien, both of Austria, assignors to AKG Akustiche U. Kino-Gerate GmbH, Wien, Austria

Filed Aug. 10, 1970, Ser. No. 62,441

Claims priority, application Austria, Aug. 18, 1969, A 7890/69

Int. Cl. H03h *9/30*

U.S. Cl. 333—29 **10 Claims**



A system for producing artificial reverberation using unidimensional wave guides reflectively terminated at both ends incorporates a helical spring excited into torsional vibrations by an electro-mechanical drive transducer, and includes at least one pick-off transducer converting mechanical vibrations into electrical vibrations. The drive transducer is at one end of the spring and the distance between the drive transducer and the pick-off transducer most remote therefrom corresponds to a signal transit time of substantially 50 ms. The overall length of the spring is at least 4 to 5 times this distance, and corresponds to a signal transit time of at least 200 ms. The surface of the helical spring is partially or wholly formed irregularly, and the spring has individual turns which are irregularly deformed.

3,662,293

ACOUSTIC-WAVE TRANSMITTING DEVICE

Adrian J. De Vries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

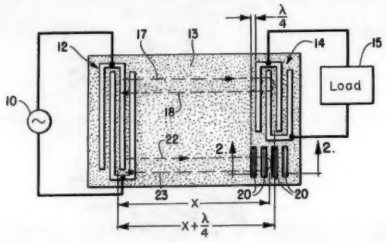
Filed Mar. 17, 1971, Ser. No. 125,100

Int. Cl. H03h *7/02, 7/30, 9/00*

U.S. Cl. 333—30 R **9 Claims**

Acoustic-surface-wave transducers are spaced apart on the surface of a wave-propagating substrate. In response to an input signal, one transducer launches surface waves toward

the other which responds thereto by developing an output signal. Without more, an undesired time-delayed output signal or "ghost" may be produced by reason of surface waves reflected back to the input transducer from the output transducer. In order to inhibit the development of ghosts, a plurality of surface discontinuities, such as grooves, are formed in the wave-propagating surface alongside the output transducer. These grooves also reflect surface waves and they are spaced from the input transducer by such a distance that surface waves reflected from the grooves reach one of the transducers in a predetermined time and phase relation with respect to an acoustic surface wave reflected by the output transducer to cause cancellation so that the development of ghosts is inhibited.



3,662,294

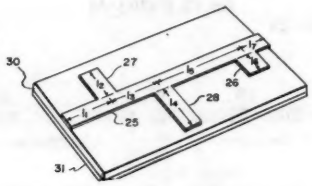
MICROSTRIP IMPEDANCE MATCHING CIRCUIT WITH HARMONIC TERMINATIONS

Paul H. Jacobs; Robert L. Peay, both of Schaumburg, and David S. Wisherd, Mt. Prospect, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 5, 1970, Ser. No. 34,695

Int. Cl. H03b 7/38; H01p 3/08

U.S. Cl. 333—33 **3 Claims**



A microstrip impedance matching circuit has fixed harmonic terminations in the form of a pair of open-circuited stubs, each having a length equal to a quarter wavelength of a different harmonic frequency, connected to the main transmission line to cause the impedance at the harmonic frequencies to be made constant irrespective of the nature of the load impedance at the harmonic frequencies.

3,662,295

ADJUSTING DEVICE FOR A COMMUNICATIONS RECEIVER

Heribert Rummer, Ingolstadt, Germany, assignor to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

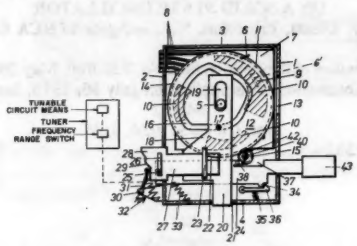
Filed Mar. 26, 1970, Ser. No. 22,856

Claims priority, application Germany, Apr. 1, 1969, G 69 13 115.3

Int. Cl. H03j 5/08

U.S. Cl. 334—7 **10 Claims**

An adjusting device for a communications receiver which comprises a plurality of potentiometers each having a plurality of resistance sections for different frequencies that can be moved over in succession by a movable wiper member. There is an actuator member for each potentiometer as well as a common frequency band changer device associated with a tuner in the receiver. The device is actuated by a linkage associated with said potentiometer between the movable wiper member, the actuator member and the frequency band changer device in dependence on the position of the movable wiper member when the actuator is operated.



3,662,296

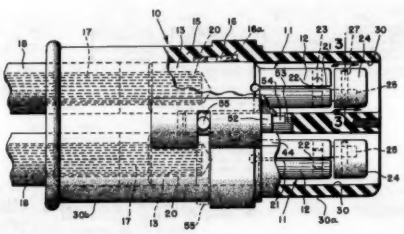
SAFETY ELECTRICAL CONNECTOR

Albert P. Newman, Springfield Township, Hamilton County, Ohio, assignor to KDI Sealtron Corporation, Cincinnati, Ohio

Filed Apr. 20, 1970, Ser. No. 29,873

Int. Cl. H01r 13/52

U.S. Cl. 339—36 **7 Claims**



A safe electrical connector assembly is provided for engaging with a mating connector, either or both connectors terminating an electrical cable, the safe electrical connector assembly including an insulating housing and therein a male contact portion having a concentric non-conductive cap. The male contact portion is disposed within a passageway in the housing of an assembly, the cap and the restricted clearance between male contact and passageway cooperating to prevent dangerous exposure to electrical surfaces.

3,662,297

SUPPORT MEANS FOR PIVOTALLY MOUNTING A POWER CABLE TERMINATION HOUSING

Henry N. Tachick, Pittsfield, and James E. Belcher, Dalton, both of Mass., assignors to General Electric Company

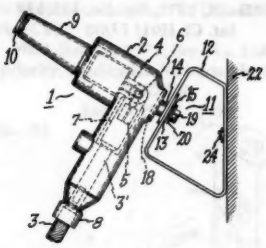
Filed Mar. 23, 1970, Ser. No. 21,712

Int. Cl. H01r 15/10, 13/60

U.S. Cl. 339—60 R **9 Claims**

Support means are provided for pivotally mounting a cable termination housing in a suitable holding bracket to position the housing in a manner such that a resilient portion of the

termination housing that forms a water-tight seal around an electric cable connected thereto is protected from undue mechanical loading so that the water-tight seal is not destroyed by such loading.



3,662,298

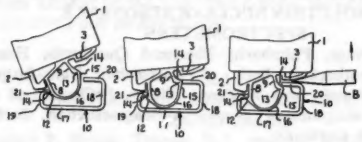
MODULAR TERMINAL BLOCK WITH MOUNTING FOOT

Hermanus Petrus Johannes Gilissen, Vlijmen, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of application Ser. No. 774,721, Nov. 12, 1968, which is a continuation-in-part of application Ser. No. 638,802, May 16, 1967, now Patent No. 3,437,983, dated Apr. 8, 1969. This application Oct. 7, 1970, Ser. No. 78,950

Int. Cl. H01r *9/22*

U.S. Cl. 339—198 GA **3 Claims**



A modular terminal block has two legs extending away from the block joined at their free ends by an arcuate flexible strap to form a foot for mounting the block on a rail. The strap deforms on engagement with the bottom of the rail to urge the legs apart so that detents on the legs firmly engage the sidewalls of the rail. One leg is inclined with respect to the block so that on removing the block from the rail the detent on that leg is more readily disengaged.

3,662,299

TIME LIMIT RELAY

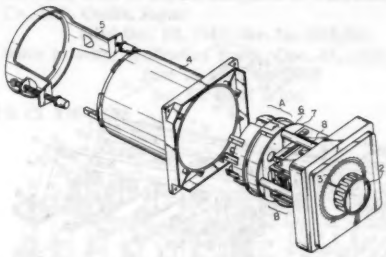
Katsumi Maruchi; Jiro Yataka; Yasukazu Tatsumi; Masayasu Wakita, and Tadashi Yamayoshi, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 13, 1971, Ser. No. 133,517

Int. Cl. H01h *7/14*

U.S. Cl. 335—68 **5 Claims**

A motor-driven time limit relay including electromagnetically controlled relay contacts, in which motor driving and contact control sections are separated by a base plate. The electromagnet of the contact control section is secured laterally to one side of said base plate. The yoke extends from an end secured to the electromagnet core to the other end, along upper face of the magnet and, at the extended end of the yoke, an armature is pivoted. A plate actuator likewise extends above the magnet and is coupled at one end to the armature for integral movement with the latter. The other free end of the actuator is normally biased to its lower position of the armature's de-attracted state. A sliding member for controlling the relay contacts positioned above the actuator is slidably mounted to a guide means secured to the other opposite end of the magnet to the armature, and is coupled to the free end of the actuator. Upward movement of the actuator free end at the time of armature attraction allows the sliding member to slide upward for relaying operation, but the sliding is normally locked by a locking lever secured to the guide means until a preset limited time reaches.



3,662,300

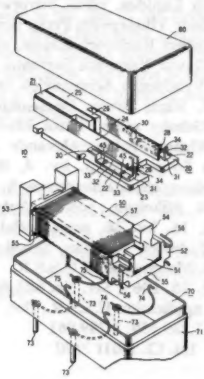
VIBRATING REED SELECTOR HAVING IMPROVED CONTACT CONFIGURATION

Larry Lee Wiese, Pickerington, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1970, Ser. No. 101,003

Int. Cl. H01h *51/34*

U.S. Cl. 335—97 **5 Claims**



A vibrating reed selector is disclosed which includes a housing, a motor assembly and a contact assembly wherein the contact assembly includes two vibrating tines, two contact brackets and a ceramic circuit board. Each tine carries a hook contact, each contact bracket carries a finger contact and the bracket and tines are arranged so that one finger contact is located between one hook contact and its supporting tine, and the other hook contact is located between its supporting tine and the other finger contact.

3,662,301

SWITCHING SYSTEM

Grant N. Willis, Bristol, Conn., assignor to Frederick H. Clymer, Jr., Harwinton; Jack R. Whiting, Bloomfield, Conn.; Mack C. Jones, Longport, N.J.; Robert E. Dallon and Warren E. Dion, Bristol, Conn., part interest to each.

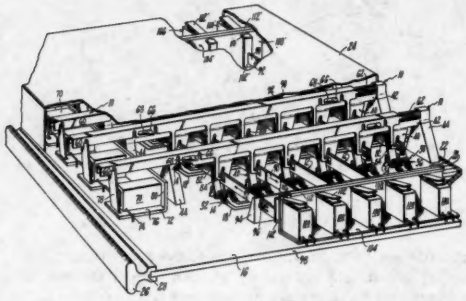
Continuation-in-part of application Ser. No. 775,414, Nov. 13, 1968. This application May 27, 1970, Ser. No. 40,760

Int. Cl. H01h *67/26*

U.S. Cl. 335—112 **54 Claims**

The switching system of this invention includes a plurality of coordinate contact sets arranged in rows and columns, ac-

tuating means corresponding to each column for selectively actuating a contact selector bar corresponding to each row when the contact selector bar has been operated to transmit



contact closing and opening forces thereto, and a contact operator at each coordinate operable by the selector bar to effect movement and an automatic latching of a selected contact set.

3,662,302

METHOD OF ORIENTATION OF ELECTRICALLY CONDUCTIVE BODIES BY MAGNETIC FIELD AND DEVICE FOR PERFORMING THIS METHOD

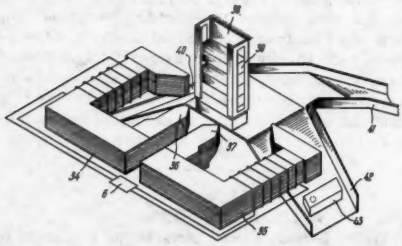
Benyamin Alexandrovich Ioffe, ulitsa Raunsas, 45/2, kv. 81; Mikhail Khaimovich Lapidus, ulitsa Suvorava, 70, kv. 9, both of Riga; Vladimir Viktorovich Preis, prospekt Lenina, 82, kv. 12, Tula; Robert Karlovich Kalnin, ulitsa Gorkogo, 53, kv. 19, Riga; Gunar Yanovich Sermons, ulitsa Skolas, 22, kv. 17, Riga; Vyacheslav Semenovich Dorofeev, ulitsa Frunzes, II, kv. 5, Riga; Bruno Domenikovich Zheigur, poselok Salspils, Rizhsky raion, ulitsa Miera, 18, kv. 7, poselok Salaspils Rizhsky raion; Alexandr Alexandrovich Shevchenko, ulitsa Suvorava, 23, kv. 4, Riga; Gennady Alexandrovich Denisov, ulitsa Shirotnava, 8, kv. 9, Gorky; Artur Eduardovich Mikelson, poselok Salaspils Rizhsky raion, ulitsa Mera, 16, kv. 36, poselok Salaspils Rizhsky raion, and Aron Judovich Makhlin, Schelkovskoe shosse, 67, korpus 2, kv. 6, Moscow, all of U.S.S.R.

Filed Dec. 16, 1969, Ser. No. 885,533

Claims priority, application U.S.S.R., Dec. 25, 1968, 1,289,059; 1,289,061

Int. Cl. H01f *7/00*

U.S. Cl. 335—219 **6 Claims**



A method and device for establishing within a zone of orientation at least two cyclically varying magnetic fluxes spaced from each other by a distance not exceeding the length of a body being oriented; with the body being positioned in this zone so that one of the two fluxes should pass through one portion of the body and the other one of said two fluxes should pass through the other portion of the body.

3,662,303

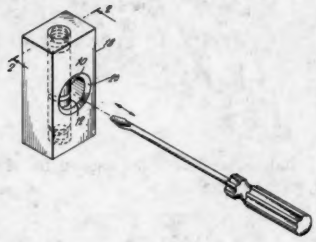
INSTANT MAGNETIZER AND DEMAGNETIZER

Anatoli Arilof, 3641 E. 8th St., P.O. Box 23011, Los Angeles, Calif.

Filed Mar. 8, 1971, Ser. No. 122,054

Int. Cl. H01f *13/00*

U.S. Cl. 335—284 **6 Claims**



An elongated non-magnetic body has longitudinal and transverse intersecting bores. Two bar magnets are disposed in aligned end to end position in the longitudinal bore and are biased toward each other by spring means. The abutting ends are oppositely poled.

3,662,304

MAGNETIC CIRCUIT STRUCTURE FOR HIGH-RESOLUTION NUCLEAR RESONANCE SPECTROMETERS

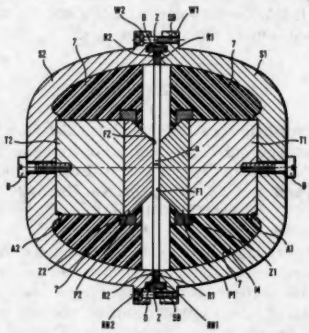
Wolfgang Bringe, Palmbach; Eberhard Querfurth; Hans-Albr. Schanbacher, both of Karlsruhe; Hans-Jurgen Seiberth, Worth, and Wolfgang Vieser, Ettlingen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 2, 1970, Ser. No. 51,979

Claims priority, application Germany, July 25, 1969, P 19 37 794.7

Int. Cl. H01f *3/00*

U.S. Cl. 335—297 **7 Claims**



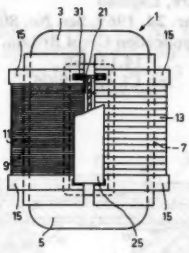
A pair of shells of approximately half-spherical form have magnetic members mounted therein with the end faces of the pole pieces coplanar with the annular end faces of the shells, coplanarity being achieved by lapping. Distance pieces are placed in notches in the annular end faces of the shells, which are filled with insulating material up to a level below the end faces of the pole pieces.

3,662,305

TRANSFORMER

Peter Martinus Cornelis Van Der Linden, and Hans Hubert Hakkenberg Van Gaasbeek, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,479
Claims priority, application Netherlands, Feb. 18, 1970, 7002230
Int. Cl. H01f 15/04
U.S. Cl. 336—84 2 Claims



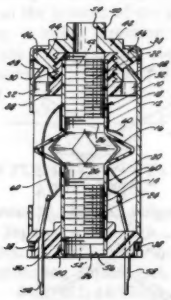
A transformer comprising an insulating body between the relatively parallel coil formers, said body being formed by a rectangular plate having upright edges on either side, the edges located in the core frame being slipped into incised parts of the coil former flanges.

3,662,306

ADJUSTABLY COUPLED RADIO FREQUENCY TRANSFORMER

Robert P. Heinis, Totowa, N.J., assignor to General Instrument Corporation, Newark, N.J.

Filed Mar. 24, 1971, Ser. No. 127,566
Int. Cl. H01f 21/04, 21/06
U.S. Cl. 336—119 6 Claims



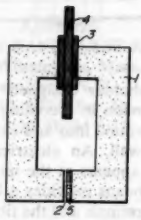
An adjustably coupled transformer comprising a one-piece coil form, preferably a cylindrical form, made of a plastic material, having two sections separated by an integral deflectable part to permit the axial adjustment of one of the form sections relative to the other, a transformer winding being mounted on each of the coil form sections adjacent the deflectable part, with means for axially adjusting one of the coil form sections relative to the other. The transformer structure is mounted in a transformer housing.

3,662,307

FLYBACK TRANSFORMER

Teruhiro Tsukuda, Moriguchi-shi, and Takashi Tsutsumi, Suita-shi, both of Japan, assignors to Matsushita Electric Co., Ltd., Osaka, Japan

Filed Dec. 10, 1969, Ser. No. 883,806
Claims priority, application Japan, Dec. 12, 1968, 43/91461; June 18, 1969, 44/59008
Int. Cl. H01f 17/06
U.S. Cl. 336—178 3 Claims



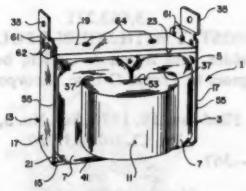
Temperature increase becomes a problem with a flyback transformer of a television receiver since it handles a high voltage. In order to cope with this, it has conventionally been the usual practice to make the core gap sufficiently great to provide allowance for the design. With such a construction, however, the transformer becomes large in size, and the high-voltage stability thereof is deteriorated. In view of this, in accordance with the present invention, a temperature-sensitive ferrite is provided in the gap of the core to prevent the slope of the B–H curve from becoming unduly small and to stabilize the high voltage during normal operation. In case the temperature is increased, the Curie point of this temperature-sensitive ferrite is utilized to improve the temperature stability of the flyback transformer.

3,662,308

TRANSFORMER CORE AND COIL MOUNTING FRAME

Peter W. Muschong, St. Louis, Mo., assignor to Central Moloney Inc., Pine Bluff, Ark.

Filed Apr. 29, 1971, Ser. No. 138,722
Int. Cl. H01f 27/26
U.S. Cl. 336—210 19 Claims

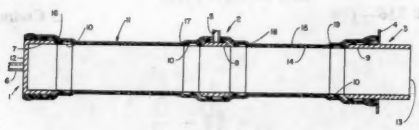


A transformer core and coil mounting in which two generally rectangular core loops disposed side-by-side and having a coil surrounding their two adjacent legs are held in a rectangular frame for mounting the unit in a transformer tank, with means extending laterally of the frame and projecting up from the bottom and down from the top of the frame between the adjacent legs of the loops and having a close fit in the coil for holding it against shifting laterally relative to the frame, and with said flanges extending up from the bottom of the frame, the core loops being supported on the upper edges of the flanges whereby the core loops are electrically grounded to the frame.

3,662,309
ELECTRICAL FUSEHOLDER

Emerson R. Harmon, Lisbon, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 28, 1970, Ser. No. 67,727
Int. Cl. H01h 85/20
U.S. Cl. 337—202 9 Claims

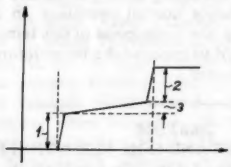


An electrical fuseholder designed to be leakproof and adaptable for submersion in a cooling fluid. The fuseholder has metal terminals wound into and extending through a surrounding fiberglass wall. An electrical contact surface of each metal terminal appears at the inner fiberglass wall. An elastomeric sealing means provides a bonded leakproof seal between the metal terminals and the fiberglass wall.

3,662,310
SAND-FILLED ELECTRIC FUSES

Per Ostergaard Nielsen, Copenhagen, Denmark, assignor to Aktieselskabet Laur. Knudsen, Nordisk Elektricitets Selskab, Copenhagen, Denmark

Filed July 9, 1970, Ser. No. 53,348
Claims priority, application Denmark, May 4, 1970, 2250/70
Int. Cl. H01h 85/38
U.S. Cl. 337—290 3 Claims

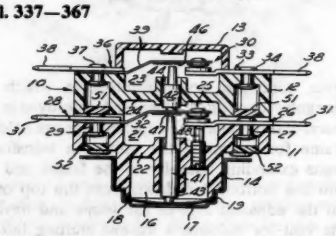


In a sand-filled electric fuse, the fuse element and the surrounding sand consist of or contain such materials that mutually react chemically in an exothermic process at temperatures above the melting point of the fuse element. The fuse element may predominantly consist of aluminum or magnesium and the filler material may be quartz sand.

3,662,311
THERMOSTAT WITH DOUBLE POLE SWITCH

Harold F. Snider, and Anton J. Gerich, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Jan. 19, 1970, Ser. No. 3,729
Int. Cl. H01h 37/70
U.S. Cl. 337—367 4 Claims

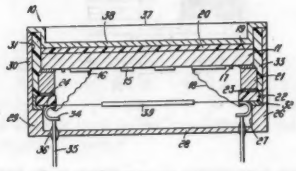


A double pole thermostat is disclosed in which two switches are mounted in separate switch cavities separated by insulating material so that arc splatter cannot produce a conductive path between the switches. The switches are sequentially operated by a bimetallic snap disc with a first bumper extending between one switch and the disc, and a second bumper extending between the two switches. The second bumper provides lost motion to insure sequential operation of the switches and to insure that unequal contact wear will not result in one switch blocking the other switch open.

3,662,312
SEMICONDUCTOR STRAIN TRANSDUCERS

William Thorp, Timperley, and Charles Trevor Jones, Wilmslow, both of England, assignors to Ferranti, Limited, Hollinwood, Lancashire, England

Filed Mar. 24, 1969, Ser. No. 809,848
Claims priority, application Great Britain, Mar. 23, 1968, 14,139/68
Int. Cl. G01l 9/06
U.S. Cl. 338—4 15 Claims

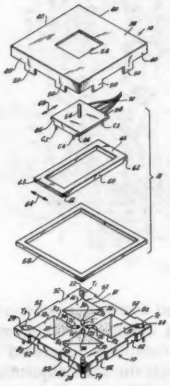


A strain transducer having a plurality of piezo-resistive sensing elements formed adjacent to one major face of a semiconductor wafer is wholly assembled by employing techniques compatible with the structure of the semiconductor wafer, these techniques including bonding the wafer to a rigid metal supporting ring which in turn is bonded to an annular insulating member secured to the transducer housing.

3,662,313
SINGLE CONTROL DEVICE FOR PLURAL VARIABLE RESISTORS

Hiroaki Komatsu, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1971, Ser. No. 133,941
Int. Cl. H01c 9/02
U.S. Cl. 338—90 24 Claims



A control device for use in volume adjustment of a multi-speaker sound system utilizes a floating carrier adapted to move within a housing enclosure in two dimensions. The carrier is provided with a plurality of electrical contacts adapted

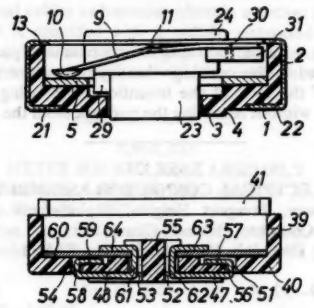
to slidingly engage respectively a plurality of resistive elements on a substrate. The carrier is moved by a control member extending through a window in the housing. The shape of the window and the resistive patterns of the plurality of resistive elements is such that the operative resistances may be simultaneously varied to adjust the sound volume of a plurality of speakers in correlation with the position of the control member within the housing window.

3,662,314

ADJUSTABLE ANNULAR POTENTIOMETER WITH TERMINAL ATTACHMENT MEANS

Juan-Luis Heredero, Barcelona, Spain, assignor to Piher S.A., Barcelona, Spain

Filed July 28, 1969, Ser. No. 845,200
Claims priority, application Spain, July 30, 1968, 356,952; May 13, 1969, 367,693
Int. Cl. H01c 9/02
U.S. Cl. 338—163 **2 Claims**



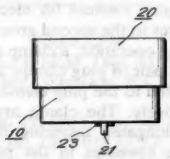
A potentiometer comprising a casing having a short height relative to its diameter and constituting a receptacle for a resistor element and a sliding contact for contact with the latter, the resistor element being supported on the bottom of the casing and the sliding contact being arranged in permanent mechanical and electric contact therewith, being of annular and laminar shape and having a diameter substantially equal to that of the resistor, the shape of which constitutes an incomplete circular annulus having a zone of discontinuity exhibiting a small angle, corresponding to a projection formed on the bottom of the casing and serving as a travel-limiting stop in either direction in order to limit the rotational travel of the axial actuating element, the manipulation of which produces the rotation of the sliding contact on the resistor element.

3,662,315

CONTACTLESS PUSH-BUTTON TYPE SWITCHING APPARATUS

Toshio Mogi, Ayasemachi, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1970, Ser. No. 80,091
Claims priority, application Japan, Oct. 13, 1969, 44/97451; 44/97452; 44/97453
Int. Cl. H01c 7/16
U.S. Cl. 338—32 H **10 Claims**



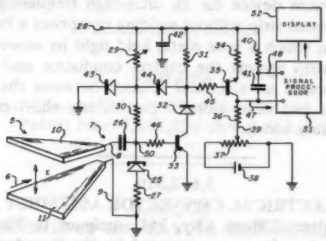
A contactless push-button type switching apparatus comprised of a base, a push-button cap which is always held at the limit upward position by a resetting means, a guide tube for the cap, a magnetic path composed of a U-shaped magnetic frame, and a movable yoke which moves about one of its ends as a fulcrum at one leg of the U-shaped magnetic frame and the moving end of the yoke closely approaches the other of the legs whenever no pressure is applied to the push-button cap, a galvano-magnetro effect device fixed to the free end of the magnetic frame near the moving yoke and which varies the magnetic flux applied with rotation of the movable yoke, and a projection from the cap to cause the moving yoke to rotate when the cap is depressed.

3,662,316

SHORT BASE-BAND PULSE RECEIVER

Kenneth W. Robbins, Wilmington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 12, 1971, Ser. No. 123,720
Int. Cl. H03b 3/02; H03d 1/18; H04b 7/00
U.S. Cl. 340—167 R **12 Claims**



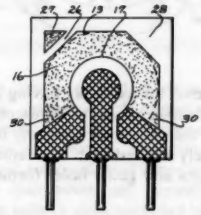
A pulse receiver for detecting short base-band electromagnetic pulses employs a dispersionless, broad band transmission line antenna with a circuit cooperating with a biased semiconductor diode located within the transmission line for instantaneously detecting substantially the total energy of the base-band pulse and providing a corresponding output suitable for application in conventional utilization circuits.

3,662,317

ABRADED VARIABLE RESISTANCE CONTROL AND METHOD OF MANUFACTURE

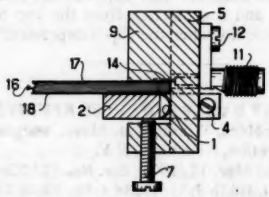
Joseph Digirolamo, Elkhart, and Ronald L. Stuckey, Berne, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Aug. 5, 1970, Ser. No. 61,282
Int. Cl. H01c 9/02
U.S. Cl. 338—174 **11 Claims**



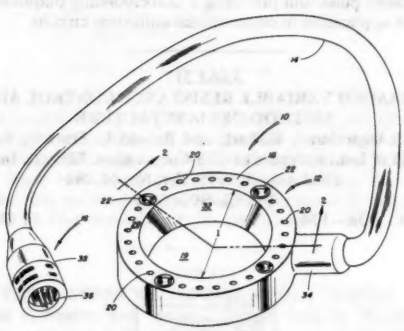
A variable resistance control is provided wherein a resistance path having an inner edge defined by a circular arc and an outer edge defined by straight lines tangent to an imaginary circular arc concentric with the circular arc defining the inner edge is supported on a nonconductive base. The straight lines intersect to define corners at the outer periphery of the resistance path. In order to bring the resistance within specified tolerances without materially affecting the linearity of the resistant path, the corners are abraded by removing a portion of the resistance material between the imaginary circular arc and the outer edge at the corners.

3,662,318
TRANSITION DEVICE BETWEEN COAXIAL AND MICROSTRIP LINES
Jean-Claude Decuyper, Paris, France, assignor to Compagnie Generale D'Electricite, Paris, France
Filed Dec. 23, 1970, Ser. No. 100,943
Int. Cl. H01p 3/08; H01r 17/04
U.S. Cl. 339—17 R 8 Claims



A conversion device for an ultra-high frequency coaxial line and a metal strip without welding comprises a brass support body in which a base plate, held tight by screws forces the metal strip against the central conductor and a plate spring to ensure an electrical contact between the ground wires of the two lines along a particularly short path free from stationary waves.

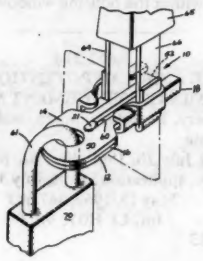
3,662,319
ELECTRICAL CONNECTOR ASSEMBLY
Paul L. Culver, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy
Filed May 28, 1970, Ser. No. 41,237
Int. Cl. H01r 11/00, 13/50
U.S. Cl. 339—28 3 Claims



An electrical connector assembly having a male connector and a ring-shaped female connector interconnected by a flexible cable wherein the connector assembly is constructed in a one piece completely molded unit. The female connector has a plurality of sockets and guide holes formed in one surface of the ring.

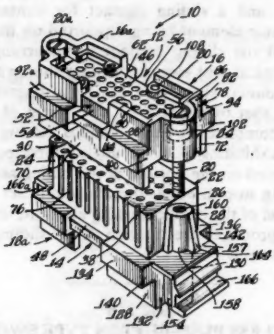
3,662,320
PLUG LOCK
Arthur J. Marx, 1048 Indian Hill Blvd., Van Wert, Ohio
Filed Dec. 24, 1970, Ser. No. 101,262
Int. Cl. H01r 13/44
U.S. Cl. 339—37 11 Claims

A lock for a conventional electrical plug comprising a frame and bolt which cooperates with the frame to secure the lock to the prongs of the plug, thereby to short circuit the prongs of the plug and to prevent the same from being inserted into a conventional electrical outlet until the lock is removed. In a specific embodiment, the frame and bolt have openings therein which coincide when the frame and bolt are



in a locking position such that the shackle of a padlock can be positioned in the openings thereby to prevent the frame and bolt of the lock of the invention from being removed from a plug without removing the padlock from the lock.

3,662,321
ELECTRICAL CONNECTOR ASSEMBLY
Allen J. Bury, Prospect Heights, Ill., assignor to Molex Products Company, Downers Grove, Ill.
Filed July 10, 1970, Ser. No. 53,862
Int. Cl. H01r 13/54
U.S. Cl. 339—92 M 10 Claims



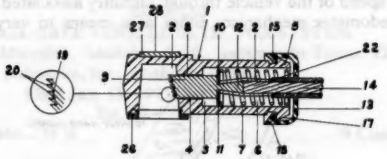
An electrical connector assembly is disclosed herein and generally comprises a plug element adapted to encase the terminal ends of a first group of wires and a receptacle element adapted to encase the terminal ends of a second group of wires. The receptacle element is further adapted to receive and mate with the plug element for electrically connecting the first group of wires to the second group of wires. In order to achieve this mating operation, a clamp arrangement is provided and includes a pair of plug clamps and a pair of receptacle clamps assembled to the plug element and the receptacle element respectively. The clamp arrangement also includes a pair of elongated fastening members insertable through cooperating openings in the plug and receptacle elements into mating engagement with each other.

3,662,322

BATTERY TERMINAL CONNECTORS

Charles Archer Morrison, Port Elizabeth, Republic of South Africa, assignor to Drosdy Importers Proprietary Limited, Worcester, Cape Province, Republic of South Africa

Filed Aug. 7, 1970, Ser. No. 62,084
Claims priority, application South Africa, Aug. 8, 1969, 69/5686
Int. Cl. H01r 11/24
U.S. Cl. 339—95 B 11 Claims



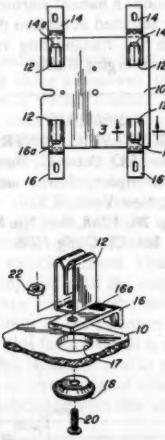
This invention is concerned with connectors for connecting electrical cables to batteries wherein a socket for the terminal post is provided with a radially extended formation housing a springloaded post engaging plug and a cap is fitted to retain the plug in position with the cable secured to the plug.

3,662,323

METER SOCKET BASE ASSEMBLY

Harris I. Stanback, Lexington, Ky., assignor to Square D Company, Park Ridge Ill.

Continuation of application Ser. No. 771,463, Oct. 29, 1968, now abandoned. This application May 18, 1970, Ser. No. 38,472
Int. Cl. H01r 9/00
U.S. Cl. 339—198 M 4 Claims



A flanged cup is inserted in an aperture in an insulation plate from one side, and a terminal strap and a plug-in contact jaw member are secured by a screw and nut to a flat bottom of the cup on the other side of the insulation plate.

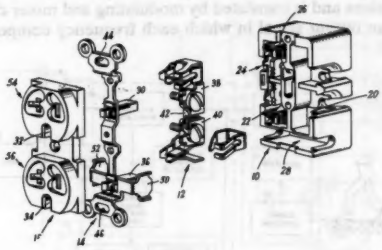
3,662,324

REINFORCED ELECTRICAL CONTACT

Walter C. Schumacher, Warwick, R.I., assignor to General Electric Company

Filed Jan. 29, 1971, Ser. No. 111,020
Int. Cl. H01r 11/22
U.S. Cl. 339—255 R 1 Claim

Improved contact pressure on power blades of an electrical cap is provided by an electrical contact formed to accept power blades in two orientations at right angles. The contact is made of a strip of metal of high conductivity and low



spring properties and is reinforced by a metal clip of lower conductivity and higher spring properties of a general "U" configuration.

ERRATA

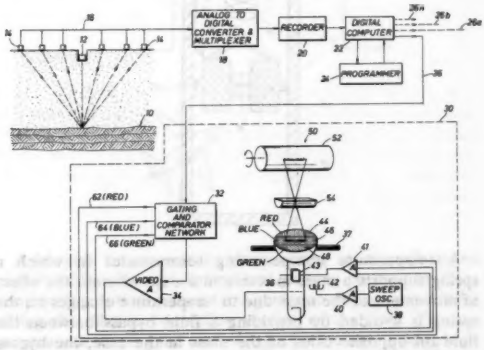
For Classes 339—60 R, 336—198 GA see:
Patent Nos. 3,662,296 thru 3,662,298

3,662,325

METHOD OF DISPLAYING SEISMIC DATA

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Aug. 27, 1969, Ser. No. 853,467
Int. Cl. G01v 1/34
U.S. Cl. 340—15.5 DS 23 Claims



This invention is concerned with displays of characteristics which are intrinsic properties of subterranean formations. They include acoustic velocity, acoustic attenuation, Poisson's ratio, acoustic impedance, elasticity (bulk modulus), density, velocity and attenuation of shear waves, etc. The intrinsic properties themselves are typically obtained and processed from the seismic data provided by conventional or modified seismic CDP or other observations.

3,662,326

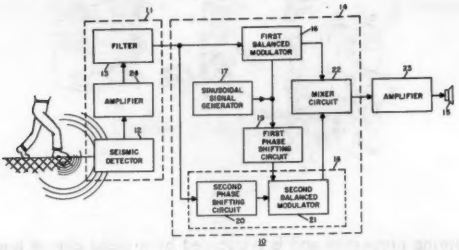
SUBAUDIBLE FREQUENCY DETECTION SYSTEM

Paul S. Dennis, Jr., East Northport, N.Y., assignor to Hazeltine Corporation

Filed Nov. 4, 1969, Ser. No. 873,867
Int. Cl. G08b 13/00
U.S. Cl. 340—15 10 Claims

Disclosed are systems usable in detecting subaudible frequencies. In one embodiment a seismic detector is shown

positioned in the earth and responding to the subaudible frequency vibrations caused by a moving person. A subaudible frequency signal is developed in response to the detected vibrations and is translated by modulating and mixer circuitry into an output signal in which each frequency component in



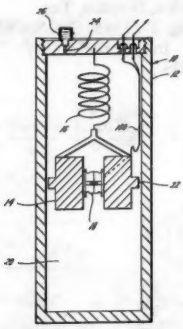
the subaudible frequency signal is represented by a single corresponding audio frequency component. The output signal is supplied to a loudspeaker for aurally distinguishing the representative audio frequency components to detect the person. Other embodiments are also covered.

3,662,327

SEISMOMETER

Gale White, 6115 Crab Orchard, Houston, Tex.

Filed Apr. 30, 1970, Ser. No. 33,472
Int. Cl. G01v *1/16*
U.S. Cl. 340—17 **6 Claims**



A temperature compensating seismometer in which a spring supports a mass movable in a case wherein the effect of movement of the mass due to temperature changes on the spring is avoided by providing a fluid bypass between the fluid on opposite sides of the mass in the case, the bypass being sized to allow passage of fluid during slow movement of the mass, but sized to retard movement of the fluid during fast movement of the mass. A seismometer which provides a mechanical magnification of the signals to be measured by making the cross-sectional area of the mass larger than the cross-sectional area of the differential pressure measuring transducer. An improved differential pressure transducer in a seismometer which provides improved sensitivity.

3,662,328

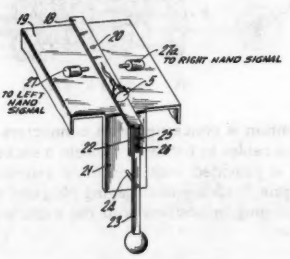
APPARATUS FOR DETERMINING THE PROXIMITY OF MOVING VEHICLES

David Spivak, One Washington Square Village, New York, N.Y.

Filed Apr. 30, 1969, Ser. No. 820,386
Int. Cl. G08g *1/00*
U.S. Cl. 340—33 **6 Claims**

The present invention provides means adaptable for use on vehicles to determine the proximity between vehicles. The apparatus generally provides means for transmitting a signal and means for receiving a signal on a vehicle with the transmitted signal preferably ultrasonic and proportional to the speed of the transmitting vehicle. The emission member is mounted on the transmitting vehicle in a manner so as to automatically selectively orient itself so that the transmitted signal follows the path of the vehicle under changing road contours and is preferably further provided with means for particular orientation for turns or merging traffic situations.

The intensity of the transmitted signal is correlated with the speed of the vehicle through circuitry associated with the speedometer mechanism either as a means to vary the re-



sistance on the transmitting circuit in ratio to the needle deflection of the speedometer or by use of the speedometer mechanism as a source for the generation of an electromotive force.

Thus, a vehicle within the reception zone will receive a warning that it is in a hazard zone as between itself and another moving or stationary vehicle and that the distance between them should accordingly be adjusted.

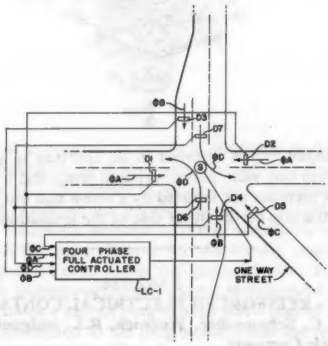
In its preferred embodiment, the apparatus of the present invention further includes a hazard warning device integrated within the system for selected actuation during desired situations, generally when the transmitting vehicle is at rest or during lane changes or merging traffic.

3,662,329

MULTI-PHASE TRAFFIC CONTROL SYSTEM

Frank W. Hill, Moline, Ill.; Peter G. Bartlett, and Larry K. Clark, both of Davenport, Iowa, assignors to Gulf & Western Industries, New York, N.Y.

Filed Aug. 20, 1968, Ser. No. 812,476
Int. Cl. G08g *1/08*
U.S. Cl. 340—37 **19 Claims**



The control system includes multi-phase solid state traffic controllers for controlling the operation of traffic signals in accordance with traffic demand. These controllers include phase selection circuitry for directly transferring a go signal

activation for one phase to a second phase for which a go signal is called for by a traffic detector without first allocating a go signal activation to another phase in which a traffic detector is not calling, i.e., is not traffic actuated. Circuitry is also provided for preempting the operation of a controller to allocate a particular preselected pattern of traffic signals. Also, circuitry is provided to ensure that after operating power has been lost and restored consistent traffic signals will be activated for all traffic phases.

3,662,330

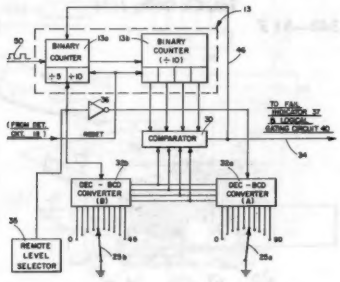
FAIL-SAFE VEHICLE DETECTOR SYSTEM

Gary L. Meredith, Anaheim, Calif., assignor to Tamar Electronics Industries, Inc., Anaheim, Calif.

Filed Jan. 18, 1971, Ser. No. 107,017

Int. Cl. G08g *1/00*

U.S. Cl. 340—38 R **9 Claims**



Primary and secondary vehicle sensors are utilized to detect vehicles moving along a roadway, this information being available for use in a traffic control system. Primary and secondary counters associated with the primary and secondary vehicle sensors respectively are driven by a timing pulse source. The counters are reset to zero in response to their associated vehicle sensors so that the maximum count thereon is indicative of the time between successive actuations of such sensors. A timing limit selector is utilized to select a timing interval indicative of a probable failure in the operation of either of the vehicle sensors. This selected timing output is separately compared with the outputs of the counters, and when coincidence between the selected timing output and the output of either of the counters is reached, a failure signal is generated. This failure signal is utilized both to actuate an appropriate fail indicator and to control logical gating circuitry to provide an output signal solely in response to the vehicle sensor not associated with this failure signal.

3,662,331

CENTRAL TRAFFIC SIGNAL CONTROL

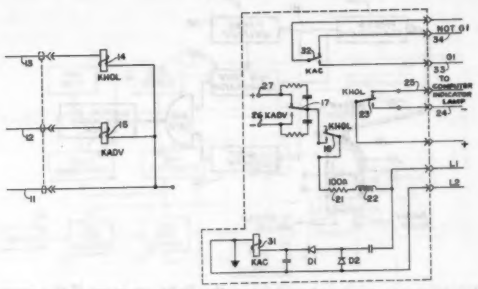
Gregory Siklos, Bronx, N.Y., assignor to The Marbelite Company, Inc., Brooklyn, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,486

Int. Cl. G08g *1/07*

U.S. Cl. 340—40 **16 Claims**

Two lines interconnect a central traffic signal control station with a local control station. The two lines carry signals from the central station to the local station that determines whether the local station is under local or central control. When on central control, the two lines carry signals that cause the traffic signal at the local station to advance to the next condition. In addition, the two lines carry signals from the local station to the central station indicative of a predetermined condition, such as the main thoroughfare



signal being green so that s shift from local control to central control may be effected without interrupting the smooth flow of traffic during the changeover.

3,662,332

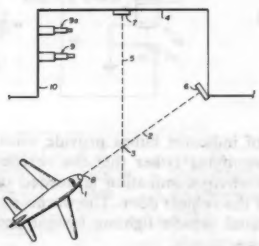
AIRCRAFT PARKING SYSTEM

Alvin L. Zechnowitz, Monsey, and James A. Xenakis, Roslyn Harbor, both of N.Y., assignors to Sperry Rand Corporation

Filed Oct. 16, 1970, Ser. No. 81,218

Int. Cl. G08g *1/14*

U.S. Cl. 340—51 **9 Claims**



Apparatus for accurately maneuvering an aircraft on an airport surface to a predetermined parking position involves cooperating optical sensors and guidance display systems for aiding the pilot in controlling motion of the craft. The apparatus aids moving the craft along a preliminary guidance or approach path to intersection of a second guidance path leading the craft precisely to a final stopped position at the parking station.

3,662,333

HYDRAULIC ACCUMULATOR CHARGE DETECTOR AND INDICATING SYSTEM

Donald W. Howard, and Dewey W. Eppley, both of South Bend, Ind., assignors to The Bendix Corporation

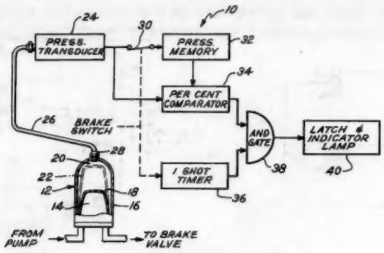
Filed Sept. 8, 1970, Ser. No. 70,255

Int. Cl. B60q *1/00*; B60t *17/00*

U.S. Cl. 340—52 C **11 Claims**

In a hydraulic braking system, a means for determining if the charge on an accumulator is low. A pressure sensitive transistor gives an output that is proportional to the pressure in the accumulator. When the brake switch is closed, the output of the pressure sensitive transistor is memorized. After a given time period, if the actual pressure in the accumulator

has dropped a predetermined amount below the memorized pressure, an output will light a warning indicator lamp. A



latching arrangement will keep the light on even if the pressure later increases and the brake pedal is released.

3,662,334

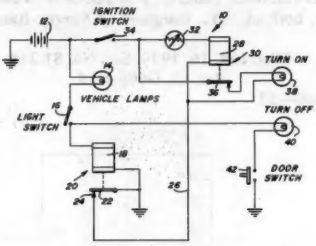
VEHICLE LIGHT WARNING SYSTEM

Ralph M. Sussiin, 212 Franklin Street, Paterson, N.J.

Filed Nov. 17, 1969, Ser. No. 877,233

Int. Cl. B60q *1/00*

U.S. Cl. 340—52 D **4 Claims**



A pair of indicator lamps provide warnings for a vehicle operator signifying either that the vehicle lamps should be turned on when illumination is needed or turned off upon opening of the vehicle door. The warning system does not affect the usual vehicle lighting system and operates off the vehicle power supply.

3,662,335

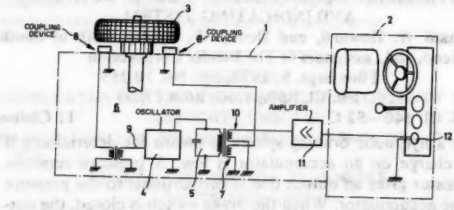
DEVICE FOR ROAD VEHICLES FOR THE WIRELESS TRANSMISSION OF AT LEAST ONE MEASURED VALUE OF A ROTATING WHEEL TO AN INDICATING INSTRUMENT

Kurt Fritze, Hamburg, Germany

Continuation-in-part of application Ser. No. 610,598, Jan. 20, 1967, now abandoned. This application Oct. 8, 1969, Ser. No. 864,651

Int. Cl. B60c *23/02*

U.S. Cl. 340—58 **6 Claims**



A device for road vehicle wheels for a wireless transmission of electrical signals corresponding with at least one measured value, such as pressure, temperature, imbalance, etc. from a coupling element of the respective wheel to a coupling means fixed to the vehicle frame in proximity to said wheel and being connected with an indicating instrument located in the driver's cab or compartment on the vehicle frame, with the coupling element of the wheel extending coaxially to the wheel hub, and the coupling element extending radially outside of the rim base of the wheel about the entire circumference of the wheel and being accommodated in the tire casing near an outer edge of the rim of the wheel.

3,662,336

COMBINATION TURN-SIGNAL AND HAZARD-WARNING SYSTEM

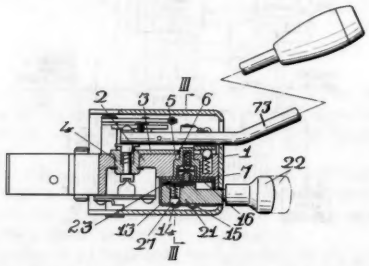
Masaru Suzuki; Masayoshi Hyodo, and Yoshiaki Kurihara, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Japan

Filed June 18, 1969, Ser. No. 834,269

Claims priority, application Japan, June 21, 1968, 43/43271; Nov. 8, 1968, 43/97704

Int. Cl. B60q *1/38*

U.S. Cl. 340—81 F **10 Claims**



A combination turn-signal and hazard-warning system for operating the indicator lamps of a vehicle selectively or simultaneously, wherein fixed contacts for a hazard switch unit are mounted on the bottom side of an insulator plate and fixed contacts for a winker switch unit are mounted on the top side of the plate. A movable contact plate is disposed adjacent the bottom side of the insulator plate and is supported on a contact holder switch is movable between a turn-signal position and a hazard-warning position. When in the hazard-warning position, the movable contact plate causes energization of all indicator lamps irregardless of operation of the directional indicator switch. A further movable conductive member is disposed for engagement with the top-side contacts to permit selective energization of the lamps on one side of the vehicle.

3,662,337

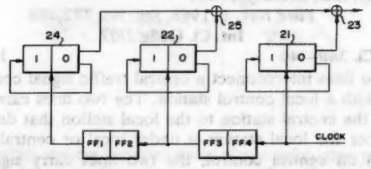
MOD 2 SEQUENTIAL FUNCTION GENERATOR FOR MULTIBIT BINARY SEQUENCE

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Tage. O. Anderson, 628 Fairview Ave., Arcadia, Calif.

Filed Oct. 1, 1970, Ser. No. 77,221

Int. Cl. G06f *1/02*

U.S. Cl. 340—146.1AL **9 Claims**



A MOD 2 sequential function generator for a *n*-bit binary sequence comprising a two-bit shift register for each pair of

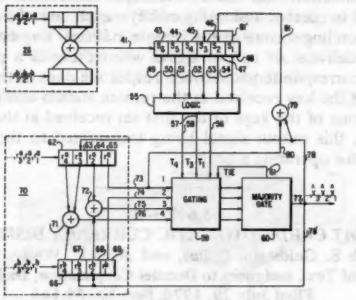
bits in the sequence. The false output of the register serves as the true input to the register. The input and output bits of each register are initially loaded to a 1 and 0 state, respectively. The true outputs of the registers are MOD 2 added to provide the generator's final output.

3,662,338

MODIFIED THRESHOLD DECODER FOR CONVOLUTIONAL CODES

Joseph Bibb Cain, III, Indialantic, Fla., assignor to Radiation Incorporated, Palm Bay, Fla.

Filed Feb. 1, 1970, Ser. No. 111,336
Int. Cl. G06f *11/12*; G08c *25/00*
U.S. Cl. 340—146.1 A **15 Claims**



A decoder for convolutional codes utilizes known threshold decoding techniques. The decoder is effective to resolve the dilemma encountered when no majority decision is available in the application of the conventional threshold decoding techniques because the estimates of the information bit to be decoded are equally divided in error and not in error. In those circumstances, the tie vote is broken by utilizing information contained in the received syndrome to specify one of the estimates of the information bit which is in error. By eliminating that estimate, a simple majority vote correctly determines the information bit since the previously encountered even split of the estimates no longer exists.

In an alternative decoded arrangement, a set of estimates for each error bit is derived and a threshold decision is made using these estimates, to remove the error bit from the estimate of the information bit. Here, again, ties are resolved by use of information contained in the syndrome of the error pattern.

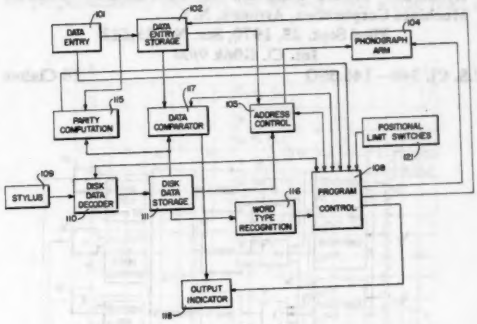
3,662,339

LISTING VERIFICATION SYSTEM

Victor M. Tyler, II, Concord; Charles G. Beaudette, Sudbury, and Allan B. Chertok, Cambridge, all of Mass., assignors to EG&G, Inc., Bedford, Mass.

Filed July 25, 1969, Ser. No. 845,021
Int. Cl. G06f *7/06*
U.S. Cl. 340—146.2 **6 Claims**

A random access comparator incorporating a phonographic recording system adapted to employ a phonographic disk on which a serial train of signals representing a list of numerical digital data entries such as derogatory credit card numbers is recorded in predetermined groups, with the numbers in each group arranged in natural order, a data entry means such as a keyboard on which a data entry can be registered, means responsive to the registration of a data entry on the keyboard for setting the arm of the phonograph to a position adjacent the vicinity on the record in which a corresponding data entry would be recorded, and apparatus for checking the recorded data in that vicinity to determine



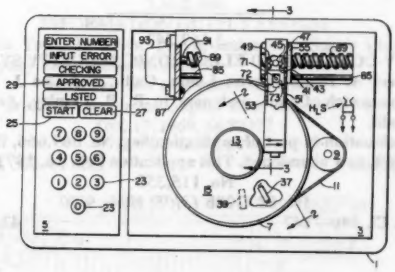
whether or not the registered entry is recorded on the record and to produce a corresponding indication.

3,662,340

DATA COMPARISON SYSTEM FOR LISTING VERIFICATION OF MULTIPLE DIGIT DATA WORDS

David R. Spencer, Waltham, Mass., assignor to EG & G, Inc., Bedford, Mass.

Filed July 25, 1969, Ser. No. 844,973
Int. Cl. G06f *7/22*
U.S. Cl. 340—146.2 **19 Claims**

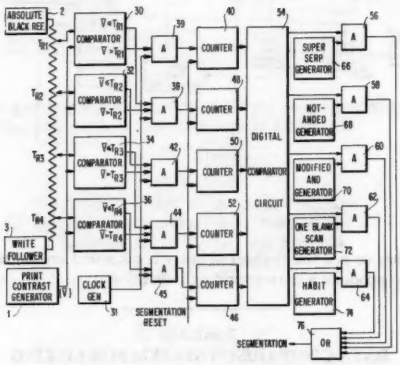


A data comparison system incorporating a phonographic recording system which includes a phonograph disk on which is recorded a train of signals representing a sequence of digital words. There is included a keyboard on which a data entry can be registered and the phonograph includes means for positioning the arm of the phonograph adjacent to that portion of the record disk in which a digital word corresponding to the data entry would be recorded. The digital words are recorded on the record in an order of 2^N groups of words, with the N least significant bits of each of the words in the group being identical and with a specific order within the group of the words. A circuitry is provided to check the entered word against the digital sequence produced from the group identified by the same N least significant bits, thereby enabling the system to provide an output indication as to whether the word is listed.

3,662,341
VIDEO-DERIVED SEGMENTATION-GATING APPARATUS FOR OPTICAL CHARACTER RECOGNITION

Richard J. Baumgartner, Rochester, Minn.; Jeffrey L. Lovgren, San Antonio, Tex., and John W. McCullough, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,513
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3SQ **10 Claims**

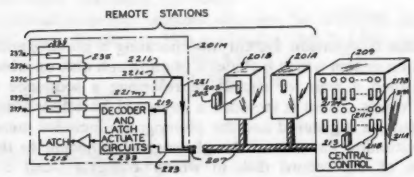


A method and apparatus for gating segmentation scheme generators in accordance with a detected video signal. A video operator signal derived from detected video signals is compared with a threshold signal. One of a plurality of segmentation scheme generators is gated on in accordance with the comparison of the video operator signal and the threshold signal.

3,662,342
KEY-CONTROLLED ELECTRONIC SECURITY SYSTEM

Robert A. Hedin, Yorba Linda, Calif., and Leo J. Pantas, Greenwich, Conn., assignors to R. B. Phinizy, Anaheim, Calif.

Continuation-in-part of application Ser. No. 889,666, Dec. 31, 1969, now abandoned. This application Feb. 16, 1971, Ser. No. 115,353
Int. Cl. G08b *13/08;* **H04q** *9/00*
U.S. Cl. 340—147 **42 Claims**



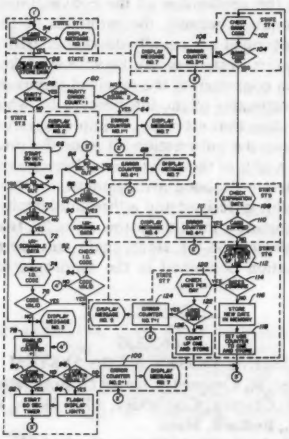
A key-actuated electronic security system having first and second keys each constituted by a plurality of circuit paths in a pattern of closed and open circuits. The system includes comparing means which electrically compares respective ones of the circuit paths of the keys and which delivers an output signal when there is a predetermined correspondence between respective ones of the circuit paths of the keys. In an embodiment employing a NAND gate, the correspondence is constituted by a complementary relationship and in an embodiment employing Exclusive-OR gates, the correspondence may be constituted by either a complementary or an identical relationship. The system includes means, e.g., a latch, responsive to the output signal for indicating the predetermined correspondence. One of the keys is readily changeable to modify its circuit pattern so that there will not be the predetermined correspondence whereby the changed key will be inoperative to cause the comparing means to deliver an output signal and thus requiring the use of a third key having circuit paths providing a predetermined correspondence with the circuit paths of the changed key in order to cause the comparing means to deliver an output signal.

Disclosed also is a key-actuated security system including a plurality of remote stations and a central control station. Each of the remote stations is adapted to provide electrical interconnection with one of the keys. The central station is adapted to receive a plurality of keys, each one of these keys corresponding to one of the remote stations. Key comparing means delivers an output signal when there is a predetermined correspondence between respective ones of the circuit paths of the key received at the remote station and of a particular one of the keys of the first set received at the central control, this output signal being transmitted to the remote station for operating a latch.

3,662,343
CREDIT CARD AUTOMATIC CURRENCY DISPENSER

Kenneth S. Goldstein, Dallas, and John D. White, Garland, both of Tex., assignors to Docutel Corporation, Dallas, Tex.

Filed July 29, 1970, Ser. No. 59,146
Int. Cl. G06f *7/00*
U.S. Cl. 340—149 **68 Claims**



A currency dispenser automatically delivers a medium of exchange in packets in response to a coded credit card presented thereto. The coded credit card is presented to the currency dispenser and an initial check is made to determine if the card has the proper format. After checking the credit card format, coded information thereon is evaluated to check the user's indentity prior to authorizing him to receive cash from the machine. When each of several additional checks of the credit card code have been completed, the old code is removed and substituted with a new code. The new code contains the same information as the old but updated to

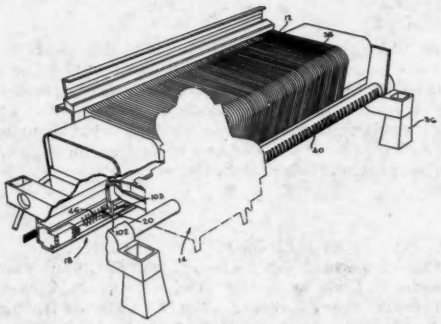
reflect an additional currency dispensing transaction. Both the original code and the updated code are scrambled in accordance with a changing key. Scrambling the credit card code after each use thereof minimizes the chance of unauthorized use of the currency dispenser. When the checks of the credit card indicate the user is entitled to receive the amount of currency he has selected, a storage container for the packets of currency transports the required number of packets by a positive feed drive to a cash drawer. The cash drawer opens to a detent position which allows the customer to then move the drawer to a fully open position to remove his currency. Upon release of the cash drawer, it returns to a partially opened position from which it automatically closes after a preset time limit.

3,662,344

AUTOMATIC PHONOGRAPH WITH PIN MEMORY UNIT AND CAM READOUT UNIT

Wilhelm Menke, Bingen (Rhine), Germany, assignor to NSM Apparatebau GmbH, Bingen (Rhine), Germany

Filed Sept. 24, 1970, Ser. No. 75,162
Int. Cl. G11b *15/00*; H04q *3/00*
U.S. Cl. 340—162 **13 Claims**



An automatic phonograph includes a record magazine and a carriage mounted for movement relative to the record magazine and having means for removing an individual record from the magazine, clamping the record to a turntable, playing the record, and returning the record to the magazine. Record selection means enable the operator to select sides of particular records for the playing thereof. To store and read out information concerning the selected records, there are provided a memory unit, a readout unit and a circuit actuable by the readout unit to align the carriage serially opposite selected records. The memory unit includes a plurality of pins corresponding to the sides of records and which are actuated in response to a signal from the record selection means and a cam track. The readout unit is mounted on the carriage and includes a cam follower adapted to ride on the cam track of the memory unit and a contact member on a sensing lever operatively associated with the cam follower. The contact member is adapted to engage an actuated pin to complete the circuit so that the carriage is aligned with the record corresponding to the pin in the actuated position.

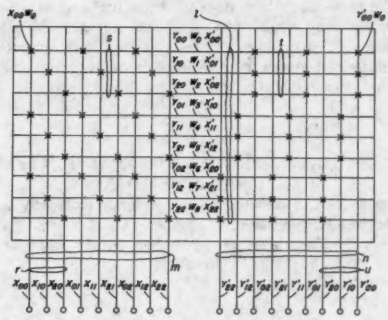
3,662,345

MATRIX SIGNAL SWITCHING DEVICE

Takeo Shinohara; Yoshikazu Miyamoto; Atsushi Minato, and Chikahiko Maeda, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 20, 1970, Ser. No. 91,266
Claims priority, application Japan, Nov. 24, 1969, 44/94069
Int. Cl. H04q *9/00*
U.S. Cl. 340—166 R **6 Claims**

A signal transfer device including a first matrix having a plurality of first input signal lines spaced in mutually parallel relation in one plane and a plurality of first signal output lines spaced in mutually parallel relation to perpendicularly intersect the first input lines in the one plane, a second matrix having a plurality of second input lines spaced in mutually parallel relation in said one plane and a plurality of second signal output lines spaced in mutually parallel relation to perpendicularly intersect the second input signal lines in



the one plane, the first and second matrices so mutually positioned that the first output signal lines and the second input signal lines are oppositely disposed, and a plurality of mutually parallel link lines, each connecting the opposing ends of one of the first signal output lines and one of the second signal input lines in the same plane, thereby obviating crossovers of the link lines.

ERRATUM

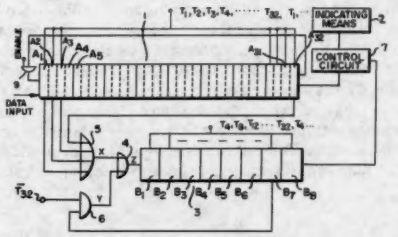
For Class 340—167 R see:
Patent No. 3,662,316

3,662,346

INFORMATION OUTPUT SYSTEM

Kiyoyuki Tada, Kyoto-fu, Japan, assignor to Sanyo Electric Company Ltd., Osaka-fu, Japan

Filed Jan. 20, 1970, Ser. No. 4,344
Claims priority, application Japan, Feb. 15, 1969, 44/11309; Oct. 17, 1969, 44/83372
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **15 Claims**



Numerical information, such as a decimal number, is registered in a main shift register for recirculation therethrough. The existence of non-zero decimal digits in a predetermined span of fixed digit positions within the main register is detected by logic means coupling the main register to an auxiliary shift register. The two registers are shifted in synchronism to the extent that a shift through one digit position in one of the registers is accompanied by a shift through one digit position in the other register; although a digit position in one register may be a decimal digit position occupied by several binary digit, or bit, positions, whereas a digit posi-

tion in the other may be a single bit position. During recirculation of the contents of the main register, a fixed pattern of information representative of the digit positions occupied in that register by the entire decimal number registered therein is ultimately generated in the auxiliary register by the logic means, as a function of the preliminary pattern generated in the auxiliary register during early circulation of the contents of the main register. This fixed pattern of information is utilized to suppress undesired "zeroes" in digit positions exceeding the most significant digit of the actual registered decimal number during visual readout of that number. An additional counter circuit coupled to this system allows suppression of the undesired zeroes while simultaneously indicating the location of the decimal point.

3,662,347

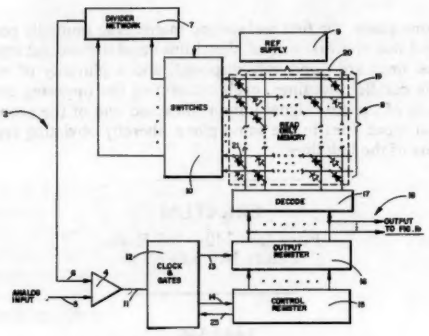
SIGNAL COMPRESSION AND EXPANSION SYSTEM USING A MEMORY

Duane C. Fox, Fullerton, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Mar. 11, 1970, Ser. No. 18,584

Int. Cl. G05b *11/26;* **G05f** *5/00;* **H03k** *13/17*

U.S. Cl. 340—172.5 **10 Claims**



The compander system uses a register having a limited number of possible digital states, or counts, each weighted to represent a certain voltage. Each count is used to address a location in a memory which stores digital numbers having a different number of bit positions relative to the bit positions of the count in the register. Each number is weighted to represent a different voltage from the voltage value represented by the register count. An analog signal is generated in response to the stored digital number for comparison with the input signal even though the register count is changed as if the voltage represented by its count had been used for making the comparison. The process is continued until the signals are within the limits provided by the least significant digit of the stored number. The number in the register is then transmitted to the receiver where the digital signal is converted into an analog signal using an additional memory and register having a limited number of bit positions.

3,662,348

MESSAGE ASSEMBLY AND RESPONSE SYSTEM

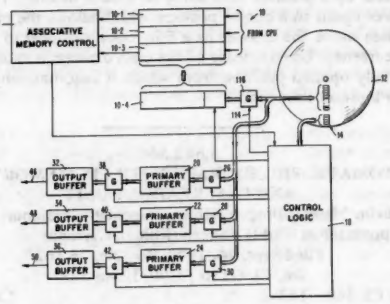
Alfred Weiss, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,235

Int. Cl. G06f *7/22*

U.S. Cl. 340—172.5 **9 Claims**

An information system which may be employed as a voice answer back system for assembling and transmitting separate messages on separate output lines. The basic components of the system are a rotating, fixed head sequential memory file, an associative memory, and a group of buffer storage units. Address keys for the words of the messages are obtained from a central processing unit. The rotating memory contains the entire file of message words stored in equal length segments of digital signals and each are identified by a key address. Message words may consist of a number of segments,



each having the same key address and further identified by consecutive segment numbers. As the sequential memory is rotated, the key addresses of the segments are compared with the key addresses in the associative memory; and when matches occur, the segments are retained in buffer storages. As each segment of a key address is obtained, the segment is transferred to the output of the system.

3,662,349

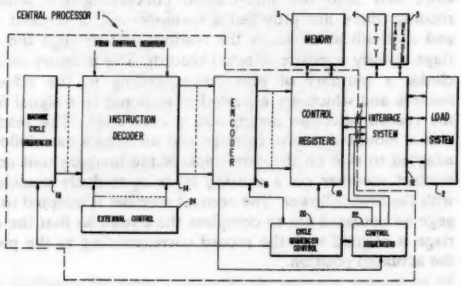
STORED PROGRAM SYSTEM

William F. Bartlett, East Rochester; John C. Gifford, Phelps; Pedro A. Lenk, Rochester; William A. Oswald, Rochester; Frank Y. Shaw, Rochester, all of N.Y.; Thomas D. Stuebe, Arvada, Colo., and Lloyd H. Yost, Honeoye Falls, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,110

Int. Cl. G06f *1/04, 9/06*

U.S. Cl. 340—172.5 **82 Claims**

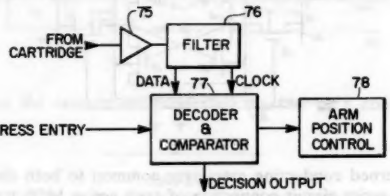


A stored program data processing system including a logic control arrangement including a particular arithmetic and logic unit controlled from instruction translating means responsive to instructions stored in a memory for effecting supervision and control over a telephone exchange in accordance with timed sequences provided by a cycle control arrangement.

3,662,350
RANDOM ACCESS MEMORY SYSTEM EMPLOYING A PHONOGRAPH DISK

Allan B. Chertok, Cambridge, Mass., assignor to EG&G, Inc., Bedford, Mass.

Filed Jan. 28, 1970, Ser. No. 6,484
Int. Cl. G11b 3/08, 17/06
U.S. Cl. 340—173 R 36 Claims

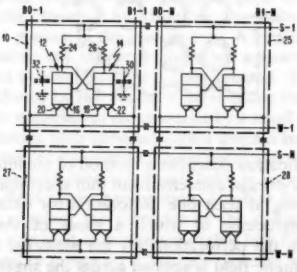


A memory system employing a phonograph disk with a multi-turn spiral groove carrying digital information distributed throughout it. The turns each contain two storage locations identified as addresses. When an address is entered, the stylus arm is moved radially across the record from a home position, impulses from the stylus resulting from traversal of the grooves being counted to determine when the stylus is at the addressed location.

3,662,351
ALTERABLE-LATENT IMAGE MONOLITHIC MEMORY

Irving T. Ho, Poughkeepsie; Gerald A. Maley, Fishkill, and Ronald Waxman, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,609
Int. Cl. G11c 11/00, 17/00
U.S. Cl. 340—173 FF 7 Claims



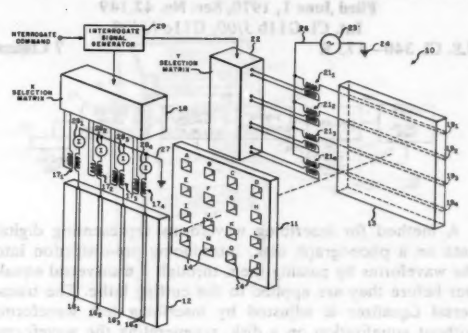
A monolithic latent image memory is one having a plurality of bistable memory cells. Selected bistable memory cells include AC impedance means which are responsive at the transition from non-sustaining voltage level to an operating level so as to set the selected memory cells to a first predetermined state and thus provide a monolithic memory which is capable of functioning in a read-only and a read-write mode. The read-only state is selectively alterable by employing an AC impedance means which is multi-valued.

3,662,352
A. C. PLASMA DISPLAY PANEL INTERROGATING APPARATUS

Dan J. Schott, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed May 25, 1970, Ser. No. 40,238
Int. Cl. G11c 11/28, 11/32, 7/00
U.S. Cl. 340—173 PL 14 Claims

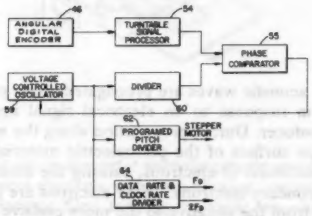
A.C. plasma display panel interrogating apparatus including coincident addressing means for applying an interrogation signal to selected rows and columns of the panel cells in combination with the sustaining signal which is normally applied thereto such that the resultant signal across the coincident cell remains at the sustaining level while at the non-coincident cells the signal strength decreases below the extinction value. This condition reduces the non-coincident cell outputs to zero with only the coincident cell providing a signal output indicative of its data storage state, thereby enabling readout to be performed with a respective current or photo sensor arranged to receive the signals from individual rows or columns of cells.



3,662,353
STORING DIGITAL DATA ON A RECORDING DISK WITH THE DATA TIME BASE PROPORTIONAL TO DISK ANGULAR VELOCITY

Allan B. Chertok, Bedford, Mass., assignor to EG&G, Inc., Bedford, Mass.

Filed June 1, 1970, Ser. No. 41,992
Int. Cl. G11b 3/36, 27/12; G11c 13/00
U.S. Cl. 340—173 R 8 Claims



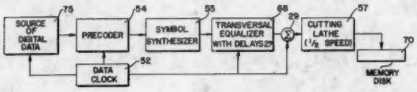
A method for inscribing a modulated spiral groove on a memory disk in which a turntable is rotated at a nominally constant rotational velocity and a digital angular encoder is fixed to the shaft of the turntable providing a stream of output pulses which varies proportionally to variations in the angular velocity. This stream of output pulses is compared in a phase comparator with a stream of pulses derived from a voltage controlled oscillator and the output from the phase comparator is applied as the control input to the voltage controlled oscillator, thereby forming a phase locked loop. The output from the voltage controlled oscillator is divided down by appropriate amounts to provide timing digital signals to control the period of the modulation waveforms applied to a cutting head, which is inscribing a spiral groove on the memory disk. The output from the voltage controlled oscillator may also be used to control the radial position of the cutting head, thereby controlling the pitch of the spiral.

3,662,354

INSCRIBING DIGITAL DATA ON A GROOVED RECORD BY PRE-DISTORTING THE WAVEFORMS

Allan B. Chertok, Bedford, Mass., assignor to EG & G Inc., Bedford, Mass.

Filed June 1, 1970, Ser. No. 42,149
Int. Cl. G11b 3/00; G11c 13/00
U.S. Cl. 340—173 R 7 Claims



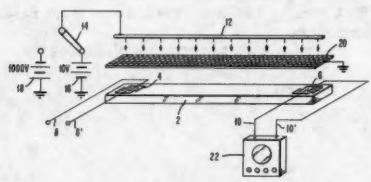
A method for inscribing waveforms representing digital data on a phonograph disk, introducing pre-distortion into the waveforms by passing them through a transversal equalizer before they are applied to the cutting lathe. The transversal equalizer is adjusted by inscribing test waveforms without equalization on a disk, regenerating the waveforms from the disk through a standardized play back system and passing the regenerated waveforms through the equalizer to a monitor. The equalizer is then adjusted to optimize patterns of the regenerated waveforms.

3,662,355

SURFACE WAVE SIGNAL STORAGE DEVICE

Benjamin Kazan, Briarcliff, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 3, 1970, Ser. No. 43,060
Int. Cl. G11c 27/00, 13/00
U.S. Cl. 340—173 R 9 Claims



Surface acoustic waves are propagated along piezoelectric material, in response to an electrical signal applied to an input transducer. During propagation along the material, the propagation surface of the piezoelectric material is flooded with a short burst of electrons, causing the emission of low energy secondary electrons. These electrons are immediately attracted from the negative to the more positive adjacent regions of the surface, neutralizing any potential variations on the surface. After the acoustic waves thereon have subsided, electrons trapped on the surface are left behind in a frozen pattern corresponding to the pattern of the acoustic waves. The acoustic waves can be reformed by again flooding the surface with a short burst of electrons. Output transducer means act to transform the reformed waves into an electrical signal.

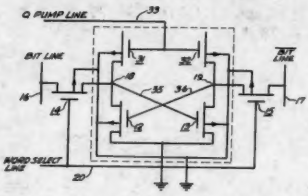
3,662,356

INTEGRATED CIRCUIT BISTABLE MEMORY CELL USING CHARGE-PUMPED DEVICES

Gerald J. Michon, Waterford, and Hubert K. Burke, Schenectady, both of N.Y., assignors to General Electric Company

Filed Aug. 28, 1970, Ser. No. 67,747
Int. Cl. G11c 11/24, 11/40
U.S. Cl. 340—173 FF 12 Claims

An integrated circuit of the bistable memory cell type utilizes two charge-transfer active elements to provide the load resistor function in a cross-coupled MOS transistor flip-flop arrangement of the memory cell. The charge-transfer element is a pulse-activated current generator formed from the substrate common to the memory cell circuit, an n- or p-type doped region diffused therein, an insulating gate layer, and a patterned conducting gate layer common to both elements. The series circuit connection of each active MOS transistor and its associated charge-transfer element is through the respective doped region which is common thereto.

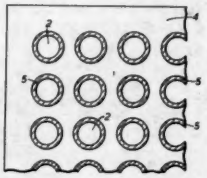


3,662,357

METHODS OF MANUFACTURING ARRAYS OF THIN MAGNETIC ELEMENTS AND ARRAYS PRODUCED BY THE METHODS

Reginald David Enoch, Pinner, England, assignor to The Post Office, London, England

Filed Mar. 30, 1970, Ser. No. 23,718
Claims priority, application Great Britain, Apr. 9, 1969, 18,163/69
Int. Cl. G11b 5/00; H01f 7/06, 1/16
U.S. Cl. 340—174 TF 9 Claims



This specification describes a method of manufacturing an array of data storage elements from thin sheet material, each element having at least one perforation for data entry and read-out conductors, in which a sheet of the magnetic material with the perforations for the elements is annealed whilst a magnetic field is applied across the sheet thereby to form lines of easy magnetization around the perforations and material is then removed from the sheet to form the separate storage elements. Examples of suitable magnetic materials include binary and ternary alloys of iron, nickel and cobalt.

3,662,358

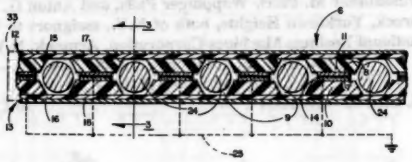
INTERSTITIAL CONDUCTORS BETWEEN PLATED MEMORY WIRES

Joseph M. Shaheen, La Habra, and John Simone, Garden Grove, both of Calif., assignors to North American Rockwell Corporation

Filed June 12, 1970, Ser. No. 45,678
Int. Cl. G11c 11/14, 11/04
U.S. Cl. 340—174 PW 5 Claims

Single copper layers on two double copper clad dielectric boards are etched into strips. The strips are used as masks for permitting channels to be etched in the exposed surfaces of the dielectric substrates. After the channels have been etched, the copper strips are re-etched into a preferred interstitial conductor width. The two boards are joined together with the copper strips and channels in registration

for forming tunnels for accommodating plated memory wires. The copper strips comprising the interstitial conductors



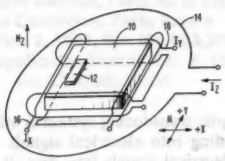
between the tunnels are connected together at a common point.

3,662,359

METHOD AND APPARATUS FOR CREATION OF CYLINDRICAL, SINGLE WALL DOMAINS

Eugene R. Genovese, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,048
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **19 Claims**



A method and apparatus for creation of cylindrical, single wall domains in selected locations in a magnetic sheet, such as orthoferrite or garnet films. A bias (stabilizing) magnetic field is applied normal to the magnetic sheet to saturate the sheet in one direction so that no reversely magnetized domains are present in the storage area. A localized magnetic field normal to the magnetic sheet but oppositely directed with respect to the bias field is then created. This localized field is produced by the action of an in-plane field and a bar of magnetic material on the sheet, or by a small current loop. The bias field is then reduced until a domain in nucleated at the site of the localized field. The domain will nucleate when the net reversely directed local field is greater than the nucleation field H_n at that location. The bias field is then increased to regulate the diameter of the domain produced. Means are provided to create a variable bias field normal to the sheet and to create an oppositely directed variable localized field at selected locations in the shett.

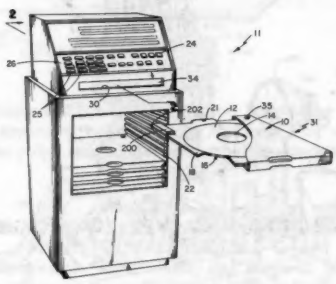
3,662,360

MAGNETIC INFORMATION DISK EQUIPMENT

Stephen Anthony Lambert, Berlin, Mass., assignor to Digital Information Storage Corporation, Berlin, Mass.

Filed June 23, 1970, Ser. No. 49,069
Int. Cl. G11b *17/04*
U.S. Cl. 340—174.1 C **3 Claims**

Information storage disk equipment for handling and storing interchangeable disks, including disk loading and rotating mechanism, a disk package and a transfer system. The loading and rotating mechanism has a disk chuck and is movable from a lowered disk release position to a raised position close to the sensing heads. The disk package is releasable and reversibly mounted in the equipment. It consists of an enclosure, an information storage disk having two flat magnetic or other recording surfaces and a disk transport with a central opening surrounding the disk providing free access to each face of the disk. The disk transport and the disk therewithin are slidably mounted within the enclosure for movement to and from it. The disk transfer system moves the disk transport with said disk between a position within the enclosure to the disk release position, with the disk transport remaining at the disk release position while the disk is moved to the raised disk position by the chuck, the disk enclosure remaining in



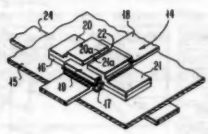
the equipment until the disk transport with said disk are returned by the transfer system. The equipment may also prevent "write" operation of a "read" condition disk, by the provision on the enclosure of a selective condition indicator for each side of the disk.

3,662,361

MAGNETIC HEAD WITH DEPOSITED CORE AND SIGNAL CONDUCTOR

C. Dennis Mee, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1968, Ser. No. 705,062
Int. Cl. G11b *5/20, 5/16*
U.S. Cl. 340—174.1 F **12 Claims**



A head for use in magnetic recording made up of a plurality of transducer elements with each element comprising a series of overlapping films forming magnetic transducers connected by conductors in a matrix configuration such that any one of the elements can be selected for use.

3,662,362

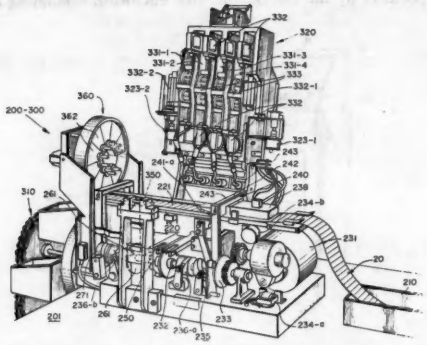
DEVICE FOR PRINTING AND CODING TICKETS

Genio R. Arciprete, Lexington; Adrian P. Brokow, Woburn; Richard L. Dumais, Ashland, and Richard F. Stucchi, Hudson, all of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of application Ser. No. 681,765, Nov. 9, 1967, now abandoned. This application Dec. 9, 1968, Ser. No. 786,813
Int. Cl. B41j *3/516*
U.S. Cl. 340—174.1 R **20 Claims**

A ticket marking machine for printing information on a ticket and also writing information on a magnetic recording media carried by the ticket. The machine has a printing or marking station for printing price and inventory information and a magnetic recording or marking station for writing the same and/or different information on a portion of the ticket

carrying the magnetic recording media. The information magnetically recorded is accomplished in the preferred em-



bodiment by a rotating magnetic head which writes the information on a concentric track.

3,662,363

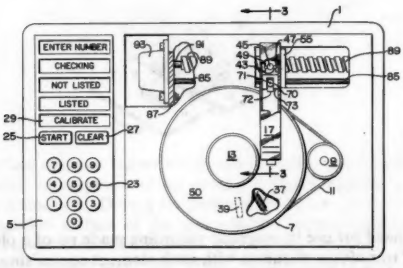
MEMORY SYSTEM USING PHONOGRAPH-TYPE DISC

Allan B. Chertok, Cambridge, Mass., assignor to EG&G, Inc., Bedford, Mass.

Filed Apr. 17, 1969, Ser. No. 817,068

Int. Cl. G11b *3/06, 3/78, 13/02*

U.S. Cl. 340—174.1 C **29 Claims**



A random access memory system for the storage of digital data in which digital signals are inscribed in a spiral groove on a phonograph record with the specific sequence of signals indicative of a radial location bearing a fixed relation to the radial location where each sequence is inscribed. The disk is supported on a rotating turntable and the digital signals are sensed by a stylus carried on an arm which can be positioned at an appropriate radial position on the disk. Address entry signals corresponding to the digital sequences in the groove are entered into the machine and control the positioning of the arm. An output signal is generated when the digital sequence read by the sensing means corresponds to the entered address. Additional digital information may be stored at specific radial positions identified by the digital addresses and this information is read out by a sensing device, only when the machine has found a match between the entered address and the digital sequence identifying the particular radial position.

3,662,364

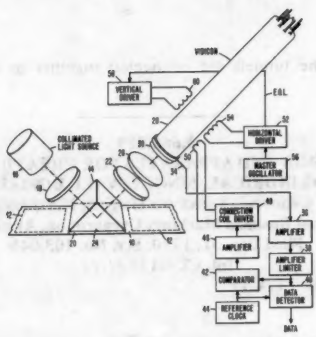
SCAN CONTROL FOR SYNCHRONIZING A DATA SIGNAL WITH A CLOCK SIGNAL

Arvindkumar M. Patel, Wappinger Falls, and Anton G. Wellbrock, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,244

Int. Cl. G11c *13/04;* **G11b** *11/10*

U.S. Cl. 340—174.1 M **10 Claims**



A magneto-optic transducing system is utilized to convert a magnetic recording into electrical signals. For purposes of decoding the electrical signals into data, it is necessary that the electrical signal transduced from a magnetic recording be synchronized with a reference clock signal. Synchronization is obtained herein by fixing the frequency of the reference clock signal and varying the frequency of the data signal as transduced from the magnetic recording. The frequency and phase of the data signal are varied by varying the scanning sweep speed used in a magneto-optic transducer. Two alternative embodiments are shown. In the first embodiment, the scanning is accomplished by a vidicon which scans the magneto-optic image of a large block of data. In an alternative embodiment, a cathode ray tube is used as the light source for the magneto-optic transducer so that each bit may be separately scanned by deflecting the beam in the cathode ray tube. Synchronization is obtained by comparing the frequency and phase of the data signal from the transducing system with the frequency and phase of the reference clock and feeding back an error signal to the deflection coils of the cathode ray tube or the vidicon. The correction signal increases or decreases the sweep speed as is necessary to synchronize the data with the clock.

3,662,365

DYNAMIC AMPLITUDE CONTROL FOR MAGNETIC TAPE SYSTEMS

Juan A. Rodriguez, Boulder, and Roger A. Monroe, Longmont, both of Colo., assignors to Storage Technology Corporation, Boulder, Colo.

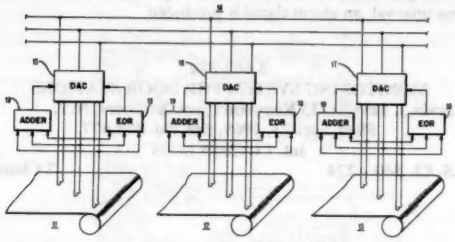
Filed Mar. 23, 1970, Ser. No. 21,826

Int. Cl. G11b *5/02;* **H03g** *3/30*

U.S. Cl. 340—174.1 H **4 Claims**

A magnetic tape system in which read heads sense signal fluctuations in the tracks in a moving magnetic tape includes dynamic amplitude control. The signals from a plurality of tracks are averaged and compared to predetermined levels. A digital counter is set in accordance with the level of the

average signal. The digital counter changes the gain of the signal produced by the magnetic head. Gain changes are



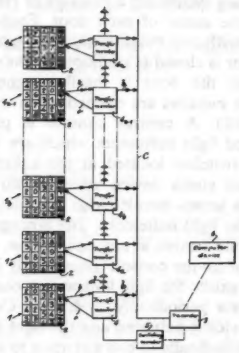
made only upon the occurrence of the end of the record being read.

3,662,366

PROCESS FOR THE REMOTE READING OF MEMBERS FOR DETECTING VARIOUS VARIABLES, PARTICULARLY OF METERS AND SIMILAR, AND DEVICE FOR OPERATING THE SAME

Claude Marie Daniel Neuville, Creteil; Georges Emile Quenouille, Vanves; Andre Squarcioni, Sceaux, and Jean-Joel Marcel Gustave Laurent, Paris, all of France, assignors to Compagnie Des Compteurs, Paris, France

Filed Oct. 2, 1969, Ser. No. 863,301
Claims priority, application France, Oct. 8, 1968, 169071
Int. Cl. G08c *15/06*
U.S. Cl. 340—183 9 Claims



The device for remote reading of successive data from a plurality of successive movable detecting members has measuring units with two distinguishable areas, a plurality of pickup elements for scanning said areas to produce a signal, transfer members connected to each pickup element, means for successively activating each transfer members in successive scanning cycles and a computer member connected to the pickup member for collating and analyzing the successive signals.

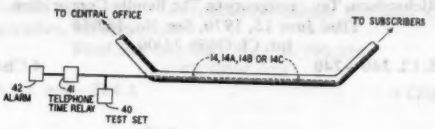
3,662,367

WATER ALARM AND FAULT-LOCATING FOR AIR CORE PLASTIC-INSULATED TELEPHONE CABLE

George Frank De Veau, Jr., Baltimore; Wendell Glenn Nutt, Phoenix, and George Harry Webster, Timonium, all of Md., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 4, 1971, Ser. No. 103,501
Int. Cl. G08b *21/00*; H02g *15/28*; G01r *31/08*
U.S. Cl. 340—235 15 Claims

A broad design for remote electrical detection of relative humidity level and liquid water in a telephone cable, while avoiding false alarms due to high relative humidity. The alarm circuit relies on a plastic barrier between one pulp in-



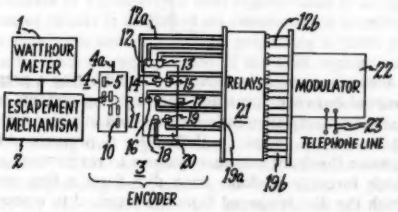
sulated conductor and a second conductor. The barrier is interrupted at separated intervals along the cable, for which points only the pulp insulation separates the two conductors.

3,662,368

TELEMETERING SYSTEM HAVING A CONTINUOUSLY MONITORING ENCODER

Richard G. Farnsworth, York, Maine, and James H. Keller, Jr., Rowley, Mass., assignors to General Electric Company

Filed Jan. 9, 1970, Ser. No. 1,609
Int. Cl. G08c *19/16*
U.S. Cl. 340—204 9 Claims



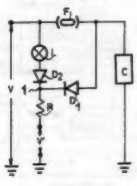
Apparatus for continuously monitoring a meter in a telemetering system and for encoding the information thus derived to adapt it for transmission in machine readable form to a location remote from the meter. The apparatus is characterized by incorporating transducer means that serve to transmit a code from the monitored meter to a telecommunications system through a non-mechanical connecting link.

3,662,369

CIRCUIT FOR SIGNALLING THE OPERATION OF A CIRCUIT PROTECTING DEVICE

Mario Vinsani, Milan, and Celio Trinca, Bregnano, both of Italy, assignors to Honeywell Information Systems Italia S.P.A., Milan, Italy

Filed Feb. 5, 1970, Ser. No. 8,952
Claims priority, application Italy, Feb. 5, 1969, 12445 A/69
Int. Cl. G08b *21/00*
U.S. Cl. 340—250 2 Claims



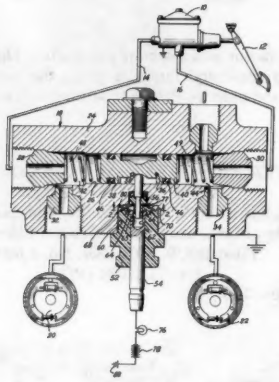
A circuit for indicating the operative state of a circuit breaker which protects a load from an alternating voltage source, wherein a lamp is coupled to said source to light when the breaker is open, but is prevented from lighting when the breaker is closed by a forward biased diode which limits the voltage across the lamp.

3,662,370

CONE DISC LOCK-ON SWITCH

Charles M. Barnes, St. Joseph, Mich., and Blair H. Schlender, Richardson, Tex., assignors to The Bendix Corporation

Filed June 15, 1970, Ser. No. 46,058
Int. Cl. G08b 21/00
U.S. Cl. 340—240 4 Claims



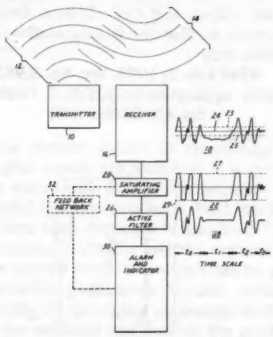
A warning switch is disclosed for indicating a pressure differential between front and rear braking systems which includes an electrical terminal connected in series with a warning device. A piston is shifted by a pressure differential between the front and rear systems to reciprocate a plunger which forces a resilient cone disc from a first position in which the disc is spaced from the terminal to a second position in which the disc completes an electrical circuit between the terminal and the grounded switch housing.

3,662,371

ULTRASONIC INTRUSION DETECTION SYSTEM SIGNAL PROCESSING CIRCUIT

John H. Lee, Township of Woodbury, Washington County, and Thomas E. Collins, East Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 17, 1969, Ser. No. 877,173
Int. Cl. G08b 13/00
U.S. Cl. 340—258 R 8 Claims



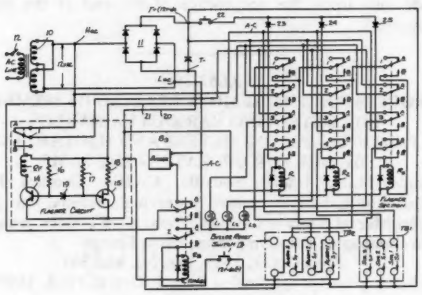
An electronic device for processing the amplitude modulations of a received ultrasonic carrier wave to produce an alarm signal when the pattern of the amplitude modulations is characteristic of an alarm condition. The device produces an electrical signal which is representative of the amplitude modulations of a received wave. When the electrical signal has a frequency within a predetermined pass-band, is of at least a predetermined amplitude, and persists for a minimum time interval, an alarm signal is produced.

3,662,372

MONITORING SYSTEM FOR DOOR STATIONS

Marvin J. Levy, 2133 Kenwood Place, Bellmore, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,677
Int. Cl. G08b 13/08
U.S. Cl. 340—274 7 Claims



A monitoring system for a plurality of remote door stations to indicate the status of each door. Each door operates in conjunction with two switches, both of which remain closed when the door is closed (Condition I). Only the first switch is opened when the door is legally opened (Condition II) whereas both switches are opened when the door is violated (Condition III). A central console is provided including relay-operated light indicators which are individually wired to the first switches located at the several stations and a relay-operated alarm device which is wired to the second switches in a series circuit. Also provided is a flasher unit coupled to the light indicators. The arrangement is such that when Condition I exists at any one station, the corresponding light indicator on the console gives steady illumination; when Condition II exists, the light indicator is caused by the flasher unit to operate periodically; and when Condition III exists, the alarm device is actuated and the light indicator is caused to operate periodically to call attention to a violation.

3,662,373

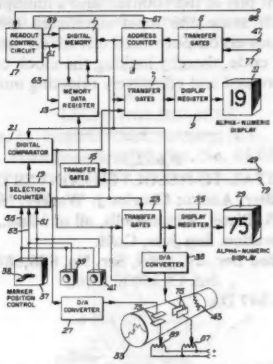
INFORMATION DISPLAY SYSTEM

Robert W. Schumann, Madison, Wis., assignor to Fabri-Tek Instruments, Inc., Madison, Wis.

Filed Feb. 26, 1970, Ser. No. 14,488
Int. Cl. G08b 5/22
U.S. Cl. 340—324 A 19 Claims

Apparatus for providing a numerical display of a selected point on an analog waveform displayed on an analog display device connected to and operated by a digital memory and its associated circuitry, the apparatus including marking circuitry for selectively marking a point on the analog waveform. The marking circuitry is connected to a digital comparator which is in turn connected to compare portions of the memory associated circuitry with a selection counter capable of counting either up or down. Manually operable apparatus is provided so that an operator may control the number of count pulses to the selection counter and the direction of count. As the count is the selection counter va-

ries the marking circuitry provides a visual marking which varies along the analog waveform being displayed, while



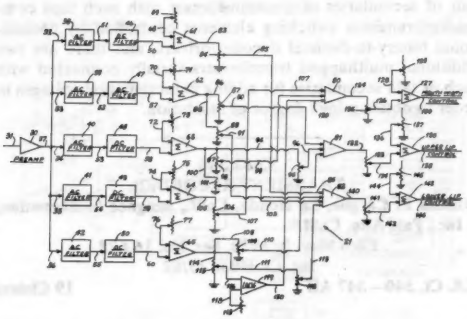
alpha-numeric readout equipment provides number values for the coordinates of the point being marked.

3,662,374

AUTOMATIC GENERATION OF A MOUTH DISPLAY AND ANIMATION OF THE MOUTH IN RESPONSE TO SOUND

Lee Harrison, III, Camarillo, Calif.; Francis J. Honey; Edwin J. Tajchman, both of Denver, Colo., and Lloyd W. Bowles, Lakewood, Colo., assignors to Computer Image Corporation, Denver, Colo.

Filed July 13, 1970, Ser. No. 54,305
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **17 Claims**



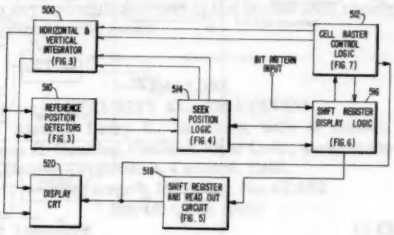
Automatic synchronization of movement of a computer generated mouth to movement of a real mouth uttering words. Establishing signals to define the basic form of the mouth generated by the computer for display on a display tube. Combining high frequency sine and cosine signals with the basic form signals to form the body of the mouth on the display tube with modulation of the high frequency signals for shaping the lips. Utilizing pattern recognition and filtering signals of different frequencies that correspond to different spoken sounds. Combining the filtered signals to create control voltages representative of the realistic or alternatively, intentionally impressionistic motions of the mouth corresponding to the spoken sound. Using the control voltages to control movement of the beam of the display tube to effect the amplitude of movement of the upper lip, the amplitude of movement of the lower lip, and the width of the mouth generated by the computer. Controlling the intensity of the beam as the mouth is drawn and animated.

3,662,375

SHIFT REGISTER DISPLAY

David L. Johnston, and Paul E. Nelson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1969, Ser. No. 790,221
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **4 Claims**



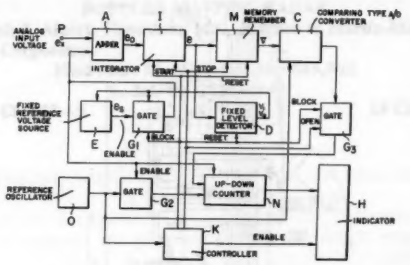
The contents of a matrix-type shift register used in an optical character reader is displayed on command on a cathode ray tube. Display is accomplished by generating a raster pattern scan for each storage position of the shift register, said raster pattern scans being at the same relative positions to one another as the storage positions in the shift register. Each raster pattern scan, referred to as a cell raster, is intensified if the corresponding shift register storage cell contains a video or "black bit." If the storage cell does not contain a black bit, the corresponding cell raster is not intensified. A partial outline of all cell rasters may be intensified to provide a visual indication of all cell positions. The resulting pattern displayed by the cathode ray tube is a configuration which corresponds to the configuration of black bits held in the shift register.

3,662,376

ANALOGUE-DIGITAL CONVERTING APPARATUS

Hikaru Furukawa, Tokyo, and Hiroshi Aihara, Gyoda, both of Japan, assignors to Takeda Riken Industry Company Limited, Tokyo, Japan

Filed Apr. 7, 1970, Ser. No. 26,212
Claims priority, application Japan, Feb. 24, 1970, 45/15184; Apr. 9, 1969, 44/26857
Int. Cl. H03r *13/17*
U.S. Cl. 340—347 AD **3 Claims**

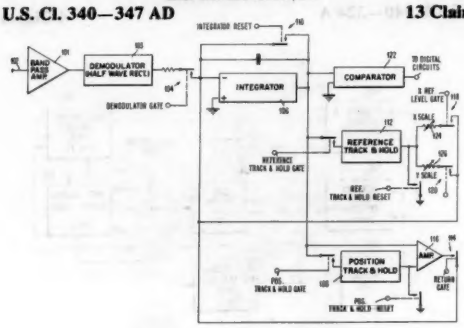


In the present invention, a quantity to be converted is integrated for a fixed time and, during the integrating period, whenever the output voltage of the integrator reached a reference level, a reference quantity having a polarity reverse to that of the quantity to be converted is added to the above mentioned integrator with the quantity to be converted.

3,662,377
TRIPLE-SAMPLE A/D CONVERTER

Herbert Dym; Robert V. Mazza, both of Mahopac, N.Y., and Lawrence P. Segar, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,400
Int. Cl. G01r 17/06
U.S. Cl. 340—347 AD 13 Claims

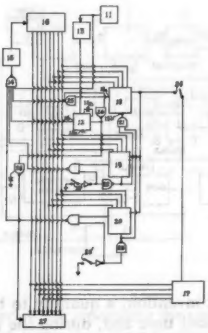


An analog-to-digital converter that eliminates dynamic coupling errors in a system where the measured signal and the reference signal are subject to such variations. This device sequentially samples an analog unknown voltage and a reference voltage and converts the sampled signals into digital information representative of the unknown voltage. Sampling and conversion is achieved in a three step process which alternates the reference and unknown signal inputs to an integrator and level holding circuits. The integrator output controls the duration of a digital counter which runs until the integrator output crosses a zero value. The result in the digital counter provides the binary value representative of the analog unknown signal. Dynamic coupling errors which occur during the reference and unknown signal sample times are eliminated by dividing the sample time of the unknown signal in two segments, a first sampling segment prior to sampling the reference signal, and a second sampling segment after the reference signal.

3,662,378
ELECTRONIC KEYBOARD INPUT CIRCUIT

Guy MacArthur, Highland Park, Ill., assignor to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed June 1, 1970, Ser. No. 41,798
Int. Cl. G06f 3/02
U.S. Cl. 340—347 DD 3 Claims

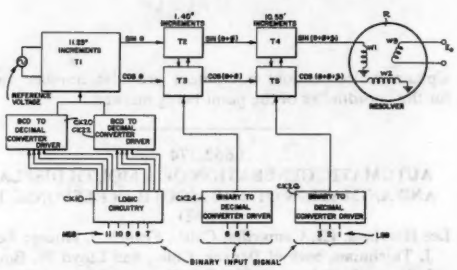


A continuously running astable multivibrator (clock) operates on electronic counter for 2^n counts, (n) being a variable dependent upon the number of bits in the code being provided. A key closure in a keyboard matrix provides a continuity path between a decoder circuit which senses the least significant bits of the counter, and a multiplexer or multiplexers which sense the most significant bits. The multiplexer provides an output which effectively stops the clock at the desired code, thereby locking the clock out as long as the key is depressed and effectively rejecting multiple key inputs.

3,662,379
DIGITAL-TO-RESOLVER CONVERTER

George W. Miller, Anoka; Charles J. Wacker, New Brighton, and James B. Dietel, Minneapolis, all of Minn., assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 29, 1969, Ser. No. 888,688
Int. Cl. H03r 13/02
U.S. Cl. 340—347 DA 10 Claims

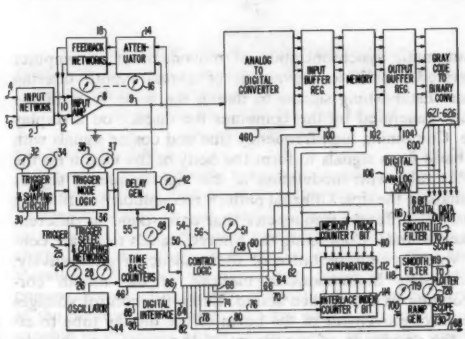


A converter accepts a digital signal comprising a binary representation of a given angle and provides an analog output for a resolver comprising a pair of voltages proportional to the sine and the cosine of that angle. The voltages are derived from a first transformer by taps in the circuits of a pair of secondaries of the transformer with such taps comprising transistor switching elements controlled by conventional binary-to-decimal decoder/drivers, and there are two additional multitapped transformers serially connected with each of said secondaries for adding in incremental voltages in order to obtain a high degree of resolution.

3,662,380
TRANSIENT RECORDER

William P. Cargile, La Honda, Calif., assignor to Biomation, Inc., Palo Alto, Calif.

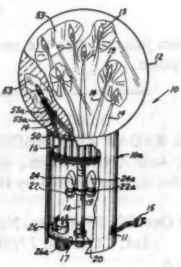
Filed Mar. 2, 1970, Ser. No. 16,628
Int. Cl. H03r 13/02
U.S. Cl. 340—347 AD 19 Claims



An analog transient signal is converted to a Gray digital code and is read into a recirculating MOS storage device.

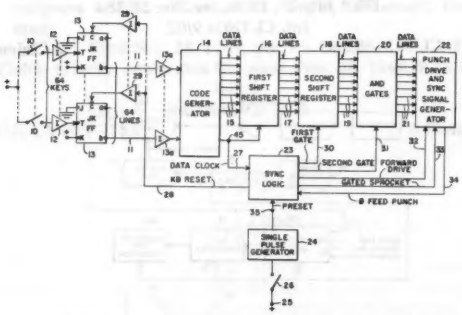
The memory is controlled by a triggering system so as to hold any desired portion of the transient signal. A slow readout from the memory is converted to a straight binary code that may be applied to a digital computer. The binary signal is further applied to a digital-to-analog converter for connection to an oscilloscope or mechanical plotter.

3,662,381
LIGHTING DEVICES
Eric Steffens, 11 Victoria Road, Ardsley, N.Y.
Filed June 8, 1970, Ser. No. 44,035
Int. Cl. G08b *5/00*
U.S. Cl. 340—378 **12 Claims**



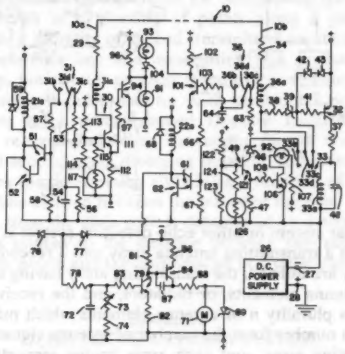
The present invention has generally reference to lighting devices and to objects derived therefrom.

3,662,382
KEYBOARD CONTROLLED ELECTRICAL CODE-SIGNAL GENERATOR SYSTEM
Irwin R. Janis, Howard Beach, N.Y., assignor to Fairchild Camera and Instrument Corporation
Filed Nov. 9, 1970, Ser. No. 87,987
Int. Cl. G08c *1/00*
U.S. Cl. 340—365 **5 Claims**



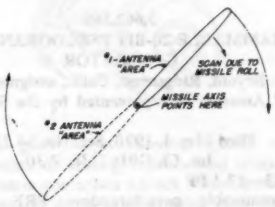
An electrical code-signal generator system for operation from a keyboard having a plurality of pulse generating keys comprises a plurality of input lines for individually receiving pulses from the keys, a normally enabled gate in each of the input lines, a code generator having a plurality of input circuits individually coupled to the gates and having a first plurality of data output lines on which appear character-representative encoded signal pulses. The generator system further comprises a first shift register coupled to the data output lines, a second shift register coupled to the first shift register and having a second plurality of data output lines and a plurality of AND gates individually included therein, and a punch and connected driving motor which develops a cyclical signal representative of and isochronous with its operating cycle. The generator system further includes an OR gate responsive to the first signal occuring on the first data output lines for developing a clock pulse commencing a predetermined interval thereafter and a circuit for applying the clock pulses to the first register for transferring data from the code generator to the output of the first register and thence to the input of the second register, a sync-logic unit jointly responsive to the clock pulses and to the cyclical signal for enabling the AND gates included in the second data lines for transferring data from the AND gates to the punch and for inhibiting all of the gates in the input lines for a minimum interval, of the order of 1 μsec, after actuation of a given key and until any data in the second shift register has been utilized by the punch.

3,662,383
SECURITY ALARM SYSTEM
Mohan Ajmani; Larry K. De Lowe, both of Dublin, and Thomas C. Hankins, Oakland, all of Calif., assignors to Systron-Donner Corporation, Concord, Calif.
Filed Aug. 7, 1970, Ser. No. 62,052
Int. Cl. G08b *19/00*
U.S. Cl. 340—409 **13 Claims**



Security alarm system of the McCulloh loop type in which the polarity of the voltage applied to one end of the loop is automatically reversed when abnormal conditions exist in the loop, thus maintaining the loop in an operable condition despite the occurrence of openings and/or shorts to ground in the loop. The voltage is automatically restored to its normal polarity upon correction of the opening and/or grounding.

3,662,384
DOPPLER MAPPING RADAR
Joseph J. Albert, Timonium, Md., assignor to Martin-Marietta Corporation
Filed Mar. 13, 1957, Ser. No. 645,862
Int. Cl. G01s *9/44*
U.S. Cl. 343—9 **15 Claims**



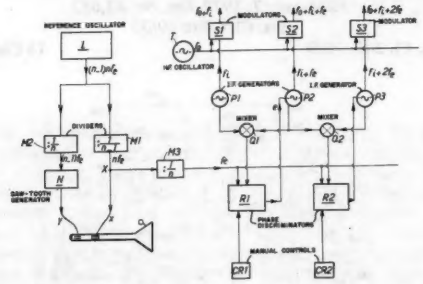
A system is disclosed for mapping terrain from a vehicle in which the area to be mapped is resolved into strips by rotat-

ing a narrow fan shaped beam with the velocity vector of the vehicle the approximate center of the scanning system. The reflected energy is multiplied by a reference signal to generate a doppler spectrum which is resolved into elements of area along the strip determined by the antenna pattern by applying the spectrum to a bank of graduated filters. The beam of an indicating device is swept along the radius of the device with the output of the filters used as an intensity control.

3,662,385
RAPID SCANNING ECHO DETECTOR

Michel Jacques Robert Nicolas, Paris, and Claude Marius Pirolli, Saint-Denis, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed Feb. 16, 1970, Ser. No. 11,693
Claims priority, application France, Feb. 19, 1969, 6904191
Int. Cl. G01s *9/04*
U.S. Cl. 343—10 **10 Claims**



A radar system or other echo detection system is disclosed in which a transmitting antenna array and a receiving antenna array are utilized, the transmitting array having a plurality p or antenna elements, or radiators, and the receiving array having a plurality n of antenna elements which may be different in number from the number of antenna elements in the transmitting array, and each array having respective signal channels. The transmitting and receiving arrays are rapidly and simultaneously scanned by an electronic scanning technique in which the reception range is scanned within the duration of the transmission pulse. According to the present disclosure, this is accomplished by the steps of feeding respective frequencies differing by a constant increment f_r to successive elemental antenna channels of the receiving array and feeding respective frequencies differing by another constant increment f_e to successive elemental antenna channels of the transmitting array, wherein the increment f_r between frequencies fed to the receiving antenna elements is greater than or equal to the product of the increment f_e between frequencies fed to the transmitting antenna elements and the number p of antenna elements in the transmitting array, i.e.,

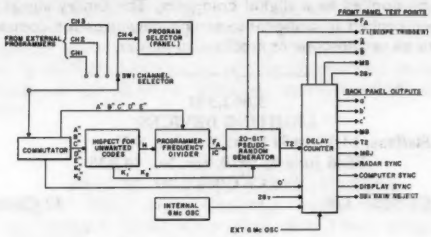
$$f_r \geq p \cdot f_e.$$

3,662,386
PROGRAMMABLE 20-BIT PSEUDORANDOM (PRF) GENERATOR

Kenneth O. Bryant, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 4, 1970, Ser. No. 34,225
Int. Cl. G01s *7/36*, *7/30*
U.S. Cl. 343—17.1 PF **6 Claims**

A programmable pseudorandom PRF generator for generating allowable combinations of PRF and jitter percent comprising a program selector means for inspecting the output of the selector for unwanted codes and a 20-bit pseudorandom generator for generating an output pulse having an allowed combination of PRF and jitter percent such that the



output pulse, when jittered, has the same average frequency as the unjittered pulse.

3,662,387
FERRITE RADAR ABSORBING MATERIAL

Dale M. Grimes, Ann Arbor, Mich., assignor to The United States of America as represented by the Secretary of the Air Force

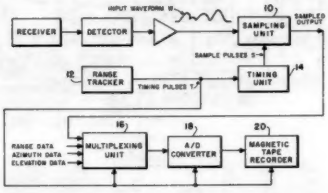
Filed Oct. 29, 1966, Ser. No. 591,064
Int. Cl. H01q *17/00*
U.S. Cl. 343—18 A **1 Claim**

A means for minimizing the reflections of electromagnetic radiations from metal surfaces in which the reflective metal surfaces is provided with a thin layer of a lithium-cadmium-ferrite material. The ferrite material acts as a protective shield by absorbing incident microwave radiations which are normally reflected from metal surfaces.

3,662,388
METHOD AND APPARATUS FOR RECORDING HIGH RANGE RESOLUTION RADAR DATA

Murray H. Mott; Donald R. Wehner, both of San Diego, and Albert T. Roome, Escondido, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 27, 1970, Ser. No. 58,384
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 SA **3 Claims**



A method and apparatus for recording analog high-range resolution radar target signatures from single airborne targets encompassed within a moving range window on digital magnetic tape formatted for direct analysis by general purpose computers. Target echoes in the form of one-dimensional range profiles of radar backscatter along target length from each of a successive number of transmitted pulses are sampled and recorded at incrementally increasing range positions within a range window until the window has been completely sampled. The apparatus samples each signature at each occurrence of a sampling pulse from a timing unit controlled by a range tracker and holds the obtained sample until the next pulse is provided. Each time a complete range window is sampled, the moving sample-point sampling sequence is repeated and another signature is reconstructed. The sampled output is time-multiplexed with range, azimuth, and elevation

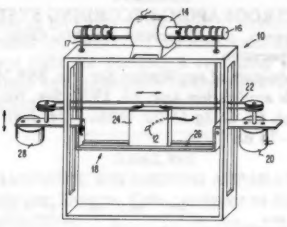
data and recorded in digital form on digital magnetic tape which can be utilized in general purpose computers to analyze signature variation with respect to target aspect variation.

3,662,389

DETERMINATION OF FAR FIELD ANTENNA PATTERNS USING FRESNEL PROBE MEASUREMENTS

Robert T. Coffin, Huntsville, Ala.; Raymond W. Grundmeyer, New Orleans, La.; William H. Hefner, and Ferd H. Mitchell, both of Huntsville, Ala., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 24, 1970, Ser. No. 31,478
Int. Cl. G01r *29/10*
U.S. Cl. 343—100 AP 2 Claims



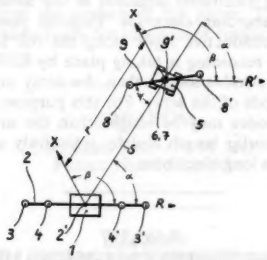
Apparatus and method for the design and measurement of microwave antenna wave patterns. The far-field radiation pattern of a space fed aperture antenna is determined as a function of the measured radiation characteristics at the antenna focus and the design or measured illumination characteristics of the feed radiator of the antenna.

3,662,390

METHOD OF AND DEVICE FOR AIMING BARRELS OF CANNONS INSTALLED IN TERRAIN FROM A REMOTE AIMING STATION

Josef Lerach, and Victor Denk, both of Dusseldorf, Germany, assignors to Firma Rheinmetall GmbH, Dusseldorf, Germany

Filed Nov. 25, 1969, Ser. No. 879,681
Claims priority, application Germany, Nov. 28, 1968, P 18 11 441.5
Int. Cl. G01s *1/08*
U.S. Cl. 343—102 6 Claims



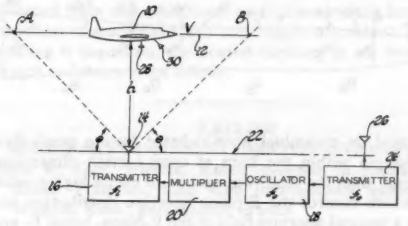
A method of and an apparatus for the training of pieces of artillery on to a target from a remote control station. At the control station is a transmitting antenna array for sending beat signals to a receiving antenna array at the piece of artillery to be trained. By measuring the phase shift of the signals received by the receiving array the angle between a base line at the control station and a reference line from the station to the artillery piece can be determined and from this a second base line at the artillery piece can be established for the purpose of laying the piece on to the target.

3,662,391

INSTRUMENT LANDING SYSTEM

William M. Brown, Ann Arbor, Mich., assignor to Chain Lakes Research Corporation, Detroit, Mich.

Filed Oct. 20, 1969, Ser. No. 867,822
Int. Cl. G01s *1/02*
U.S. Cl. 343—112 A 4 Claims



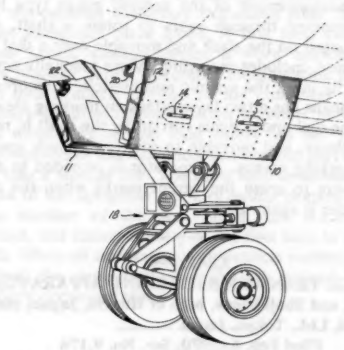
An instrument landing system for determining the altitude of an aircraft at a plurality of points along a glide path defined by a plurality of spaced transmitters located along a ground reference line and transmitting at a predetermined frequency, the aircraft receiver apparatus comprising means for producing a pulse pair for each transmitter point corresponding to a predetermined Doppler frequency shift which is realized first when converging on the transmitter point and second when diverging from the transmitter point and means for determining altitude as a function of velocity and the time elapsed between the pulses of the pair. Altitude deviation from the glide path is determined by a comparison of signals related to the distance between two succeeding transmitter points and the time spacing of a pulse pair.

3,662,392

GLIDE SLOPE ANTENNA SYSTEM

Brian P. Stapleton, and Robert W. Sutton, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 8, 1970, Ser. No. 96,034
Int. Cl. H01q *1/28*
U.S. Cl. 343—708 10 Claims

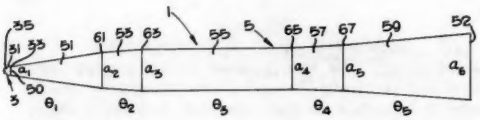


A switchless glide slope antenna system maintaining horizontal polarization during capture and track functions. The antenna system comprises a track antenna and a capture antenna arranged in an aircraft landing gear door so that switching from capture to track antenna occurs automatically upon gear extension by cross-polarization of the capture antenna.

3,662,393
MULTIMODE HORN ANTENNA

Seymour B. Cohn, Tarzana, Calif., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 20, 1970, Ser. No. 12,970
Int. Cl. H01q 13/00
U.S. Cl. 343—786 10 Claims

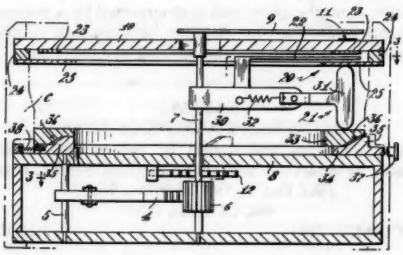


A conical or pyramidal horn-radiator having small flare angle changes within the horn at cross-section dimensions much larger than the input waveguide, to excite higher order modes which control the E-plane aperture distribution and produce a tapered aperture field in the E-plane. Equal E- and H-plane beamwidths are thereby obtained. The horn has particular use as a feed for a parabolic reflector, such as a Cassegrain antenna. The flare angle changes are used for pattern improvement in a first frequency band, and separate means are provided for pattern improvement in a second band.

3,662,394
RECORDING SPHYGMOMANOMETER

Hans A. Dudler, 36 School Street, Woburn, Mass.

Filed Apr. 13, 1970, Ser. No. 27,490
Int. Cl. G01d 9/40; A61b 5/02
U.S. Cl. 346—21 5 Claims



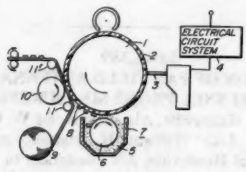
A sphygmomanometer of the aneroid gauge type having bellows connected through gears to rotate a shaft, and a pointer mounted on the shaft and movable over a dial to indicate pressure, includes recording means manually actuable to temporarily mark the systolic and diastolic pressures. The recording means has a two layer adhesion marking means attached to the dial and a stylus carried by the shaft in registry with the pointer, and movable to impress a mark upon the adhesion marking means. A separator is provided to detach the two layers to erase the earlier marks when the sphygmomanometer is again used.

3,662,395
IMAGE TRANSFER RECORDING APPARATUS

Tetsuo Doi, and Shoji Sagae, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1970, Ser. No. 9,176
Claims priority, application Japan, Feb. 7, 1969, 44/8738; Nov. 7, 1969, 44/88757
Int. Cl. G01d 15/06; B05b 5/02; G03g 5/02
U.S. Cl. 346—74 ES 9 Claims

An image transfer recording apparatus in which a recording drum on which an information signal is recorded by electrostatic recording means is provided with a surface layer of electrically insulating resin so that a powdery developer attaching to the electrostatic latent image formed on the surface of the recording drum can be completely transferred

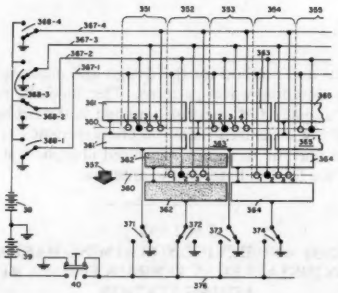


onto a recording sheet thereby to obtain a recorded image of good resolution.

3,662,396
ELECTROGRAPHIC RECORDING SYSTEM

Arling Dix Brown, Jr., Cleveland Heights, Ohio, assignor to Clevite Corporation

Continuation-in-part of application Ser. No. 868,394, Oct. 22, 1969. This application Apr. 15, 1970, Ser. No. 28,694
Int. Cl. G03g 15/00; H04n 1/24, 1/30
U.S. Cl. 346—74 ES 10 Claims



Recording electrodes of a coincidence voltage type electrographic recorder are divided into arrays. Like-numbered electrodes of different arrays are connected together. Complementary electrodes are disposed adjacent to the arrays. A latent image is formed at a selected recording electrode when suitable voltage is applied to that electrode, and in coincidence therewith, suitable voltage is applied to one or more complementary electrodes adjacent to the array containing the selected recording electrode. Uniform potential is obtained at the conductive layer along the full length of the array at which recording is taking place by having the complementary electrodes longer than the array and extending beyond both ends of the array. For this purpose, the complimentary electrodes may be longer than the array, or they may have a shorter length and be selectively connected in groups to act as long electrodes.

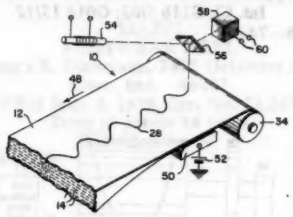
3,662,397
THERMAL SENSITIVE RECORDING MEDIUM RESPONSIVE TO FORCE FIELDS AND APPARATUS FOR USING SAME

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 25, 1969, Ser. No. 860,962
Int. Cl. G03g 15/00, 19/00; G11b 11/14
U.S. Cl. 346—74 MP 6 Claims

A recording medium is shown which is responsive to a magnetic or an electrostatic field for recording an input signal thereon. The recording medium includes a continuous web formed from a thermal sensitive material in which highly

reflective flake-like particles are preoriented parallel to the plane thereof. These preoriented, reflective flake-like particles form a light background across the surface of the recording medium by reflecting ambient light therefrom. Exposure



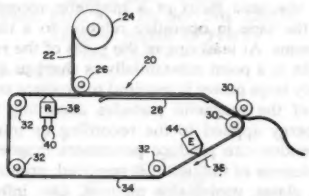
to a magnetic or an electrostatic field in response to an input signal reorients the reflective particles causing them to absorb ambient light for forming a recording trace thereon. Heat is utilized to permanently fix the recording trace upon the thermal sensitive recording medium.

3,662,398

MAGNETIC RECORDING APPARATUS

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 25, 1969, Ser. No. 861,065
Int. Cl. G03g *19/00*; G11b *5/86*
U.S. Cl. 346—74 MP **3 Claims**



A magnetic recording apparatus is shown including a magnetic transducer that records an input signal upon a thin magnetic film of material having a high remanence which is rotatively mounted upon a drum or belt. The magnetic film contacts a magnetic recording paper which responds to the recorded input signal thereon for displaying that signal as a recording upon the surface of the paper. The film is then erased and made ready for subsequent contact with the magnetic transducer.

ERRATUM

For Class 346—74 M see:
Patent No. 3,662,403

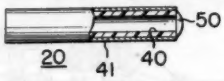
3,662,399

NOZZLE FOR INK JET AND METHOD FOR MANUFACTURING THE SAME

Takao Yanou, and Masaharu Urayama, both of Tokyo, Japan, assignors to Casio Computer Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1970, Ser. No. 36,790
Claims priority, application Japan, May 19, 1969, 44/45369
Int. Cl. G01d *15/18*
U.S. Cl. 346—140 **5 Claims**

An ink jet recording device has a movable writing head which involves at least one ink nozzle for ejecting a stream of ink jet to synthesize characters on the recording medium by controlling the stream of ink jet. Such kind of nozzle comprises a capillary made of a hard glass. Over the outer surface of the capillary a coating is deposited. This coating is



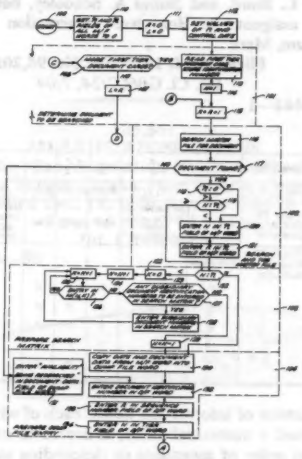
selected from materials, such as silicones, which have water-repellent characteristic and large angle of contact. After the coating is deposited, the coated capillary is cut into desired length to fabricate the nozzle.

3,662,400

SUBSIDIARY DOCUMENT IDENTIFICATION SYSTEM

John H. Geil, Wichita, Kans., assignor to Hinderstein & Silber, Fullerton, Calif. and International Systems, Inc., Wichita, Kans., part interest to each

Filed Apr. 28, 1970, Ser. No. 32,610
Int. Cl. G06f *9/12*
U.S. Cl. 444—1 **20 Claims**



In a data processing system employing a computer and a random access storage device, a program method for compiling a tier-ordered subsidiary document tree. The program method comprises three loops. A first loop culls from the random access storage device a word associated with a known Nth-tier parent document identification number, and enters into a matrix portion of the computer memory the subsidiary document identification numbers included in the culled word. The second loop enters the tier value N, the parent document identification number and part of the culled word into a storage file. The third loop determines from the content of the computer memory matrix portion the identification number of the next higher tier document to be searched, and causes reentry of the first loop to initiate such search. When all document identification numbers have been searched, the storage file contains the desired tier-ordered subsidiary document tree.

3,662,401

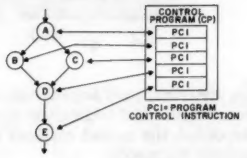
METHOD OF PROGRAM EXECUTION

Arthur A. Collins, and Wesley B. Henry, both of Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed Sept. 23, 1970, Ser. No. 74,723
Int. Cl. G06f *9/06*
U.S. Cl. 444—1 **10 Claims**

A method of activity implementation through use of automatic computation means whereby simultaneous execution

of program tasks may be performed and maximum utilization of system facilities is realized. The overall activity is partitioned into separate tasks with input requirements, desired outputs, and execution priority specified for each task. As



tasks receive ready status, they are assigned to appropriate system work stations for implementation. Each task is defined by a program control instruction and may include a plurality of sub-tasks which are performed within the system.

3,662,402

DATA SORT METHOD UTILIZING FINITE DIFFERENCE TABLES

Kenneth L. Bond, and James A. Schooley, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 4, 1970, Ser. No. 95,205
Int. Cl. G06f 7/24, 7/04
U.S. Cl. 444—1 **6 Claims**

Δ_k^m PROCESSED		Δ_1^6	Δ_2^3	Δ_3^2	Δ_4^1	Δ_2^1	Δ_1^1
(m+k, k)		(5,1)	(5,2)	(5,3)	(5,4)	(3,2)	(2,1)
ACTION TO BE TAKEN ON SEQUENCE		INTERCHANGE FIFTH AND FIRST ENTRIES	NONE	NONE	NONE	INTERCHANGE THIRD AND SECOND ENTRIES	NONE
RESULTING STATUS OF SEQUENCE	ORIGINAL SEQUENCE						
	9	2	2	2	2	2	2
	5	5	5	5	5	3	3
	3	3	3	3	3	5	5
	7	7	7	7	7	7	7
	2	9	9	9	9	9	9

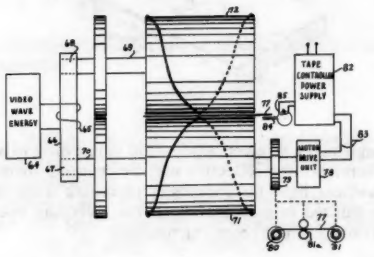
A sequence of information items, each of which has or can be assigned a numerical value, is sorted to obtain a list arranged in order of ascending or descending magnitude. This is accomplished by generating a difference table for the sequence and then interchanging various items of the sequence depending on the entries of the difference table.

3,662,403

MAGNETIC, AND MAGNETIC REMOVAL RECORDING

R. Lee Hollingsworth, 110 Fox Boulevard, Massapequa, N.Y.

Continuation of application Ser. No. 145,805, Oct. 18, 1961. This application Nov. 14, 1966, Ser. No. 594,269
Int. Cl. G11b 5/02; G01d 15/12
U.S. Cl. 346—74 M **1 Claim**



The present invention is characterized as means to scan remove magnetic particles from a magnetic coated tape; from tape having a magnetic printed basic pattern thereon such as equidistant longitudinal lines; from tape having a magnetically printed halftone continuous pattern thereon, such magnetic removal accomplished by passing the tape through the pole faces of a magnetic recording head, or passing the tape in operative relation to a magnetic transducer means. At least one of the poles of the recording head is brought to a point substantially as sharp as a needle point. Relatively large power is required to produce satisfactory elemental of the magnetic particles according to modulated wave energy applied to the recording or transducer head. The invention can produce permanent magnetic recordings by the absence of the particles removed; printing stencils and printing plates; projectable pictures, data information, projectable news and pictorial presentations including advertising, and instantaneous substitute for microfilm records. There are other applications since the packing density measurements indicate that such pictures may have 18,000,000 bits per square inch of elemental detail, and perhaps considerably more.

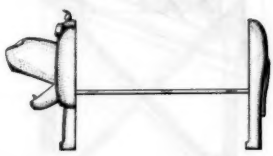
DESIGNS

MAY 9, 1972

223,557
FOOTWEAR HEEL
James E. Dickerson, 2400 Delaware St., Gary, Ind. 46407
Filed June 3, 1970, Ser. No. 23,267
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323

223,558
FOOTWEAR HEEL
James E. Dickerson, 2400 Delaware St., Gary, Ind. 46407
Filed June 3, 1970, Ser. No. 23,266
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323

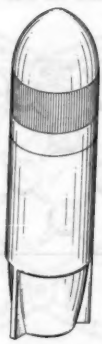
223,559
BEDSTEAD FOR CHILDREN
Ronald L. Magram, 9631 SW. 77th Ave., Apt. 208C, South Miami, Fla. 33156
Filed Oct. 5, 1970, Ser. No. 25,328
Term of patent 14 years
Int. Cl. D6—*01*; D21—*01*
U.S. Cl. D5—4



223,560
SCREW
Reiichiro Hirata, Kyoto-shi, Japan, assignor to Kabushiki Kaisha Yamashina Seikosho, Kyoto-shi, Japan
Filed Aug. 15, 1969, Ser. No. 18,698
Claims priority, application Japan June 17, 1969
Term of patent 14 years
Int. Cl. D8—*10*
U.S. Cl. D8—267

223,561
MULTIPURPOSE PLIERS
Alfred Z. Boyajian, Manhattan Beach, Calif., assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 18, 1970, Ser. No. 26,570
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—58

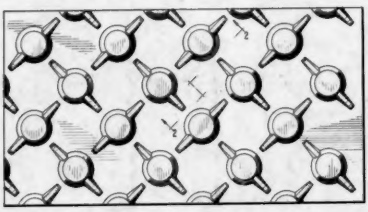
223,562
CONTAINER FOR PAINT, APPLICATOR AND RUBBING COMPOUND
John W. Madeira, Akron, Ohio, assignor to Plasti-Kote Company, a division of Consolidated Foods, Inc., Medina, Ohio
Filed Dec. 10, 1970, Ser. No. 26,396
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—196



223,563
CONTAINER FOR OIL OR THE LIKE
Herbert Warnecke, Dampfmuhlgasse 5, A–1111 Vienna, Austria
Filed Apr. 17, 1970, Ser. No. 22,495
Term of patent 7 years
Int. Cl. D9—*02*
U.S. Cl. D9—170

223,564
CAR WASH BUILDING
James B. Otterpohl, 922 San Pedro Ave., San Antonio, Tex. 78212
Filed Oct. 13, 1970, Ser. No. 25,470
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

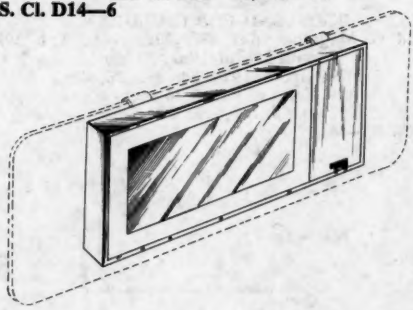
223,565
TREAD PLATE
William H. Rees, Dearborn, and Norman Solomon, Oak Park, Mich., assignors to National Steel Corporation
Filed Oct. 1, 1968, Ser. No. 13,803
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1



223,566
BUILDING
Victor J. Cassano, 3270 Governors Trail, Dayton, Ohio 45409
Filed Sept. 8, 1970, Ser. No. 24,887
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

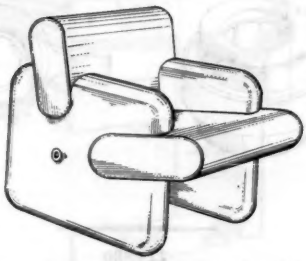
223,567
BUILDING
Mark B. Folis, Memphis, Tenn., assignor to Educare Childcare Centers, Inc., Memphis, Tenn.
Filed Nov. 23, 1970, Ser. No. 26,133
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

223,568
BATTERY POWERED ILLUMINATING MIRROR
Donald P. Stahl, North Bellmore, N.Y., assignor to Telecommunications Industries, Incorporated, Farmingdale, N.Y.
Filed May 25, 1970, Ser. No. 23,117
Term of patent 14 years
Int. Cl. D12—*16*; D6—*06*
U.S. Cl. D14—6

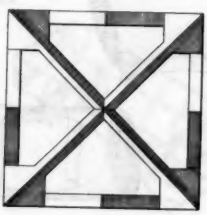


223,569
CHAIR
Raymond Grosfillex, Arbent, France, assignor to Societe Grosfillex Societe a Responsabilite Limitee, Arbent, France
Filed May 11, 1970, Ser. No. 22,909
Claims priority, application France Dec. 13, 1969
Term of patent 7 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

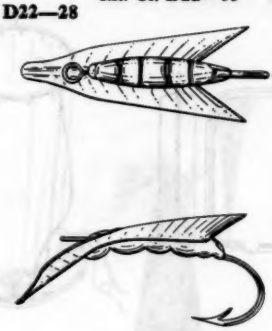
223,570
FURNITURE SEAT
Donald T. Chadwick, 141 S. Barrington Ave., Los Angeles, Calif. 90044
Filed June 3, 1970, Ser. No. 23,277
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1



223,571
BUILDING BLOCK
Conrad L. Pickel, 500 SW. 16th St., Boynton Beach, Fla. 33435
Filed Sept. 30, 1970, Ser. No. 25,268
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2

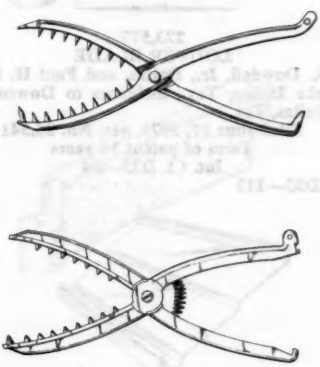


223,572
FISHING LURE
Walter J. Rogers, 417 McCourt St., Klamath Falls, Oreg. 97601
Filed Nov. 2, 1970, Ser. No. 25,759
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

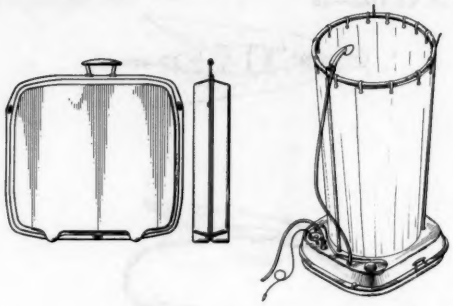


223,573
BOWSTRING RELEASE
David F. Kirkman, P.O. Box 72, Avoca, Ind. 47420, and George T. Miller, 1153 W. Main St., Mitchell, Ind. 47446
Filed July 2, 1970, Ser. No. 23,821
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

223,574
FISHERMAN'S TOOL
Harry Pittis, 3706 Harrison St. NW., Washington, D.C. 20015
Continuation-in-part of design application Ser. No. 14,596, Nov. 22, 1968. This application July 8, 1970, Ser. No. 21,109
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

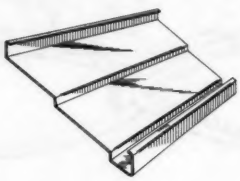


223,575
PORTABLE SHOWER
Robert D. Veech, 11 Yates Ave., Commack, N.Y. 11725
Filed May 1, 1970, Ser. No. 22,765
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



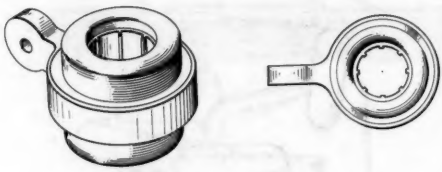
223,576
COMBINED WALL UNIT, SOAP HOLDER AND TRAY FOR A BATHTUB OR THE LIKE
Raymond Wallace Young, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Continuation-in-part of design application Ser. No. 18,377 July 24, 1969. This application July 15, 1970, Ser. No. 24,306
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

223,577
LOUVER BLADE
Joshua R. Dowdell, Jr., Dallas, and Paul H. Sanderson, Jr., Lake Dallas, Tex., assignors to Dowco Corporation, Dallas, Tex.
Filed June 17, 1970, Ser. No. 23,541
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—112

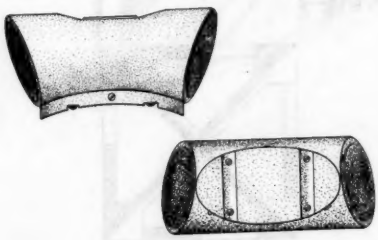


223,578
AIR FRESHENER
Andre G. Labrecque, 4946 Coolbrook Ave., Montreal 248, Quebec, Canada
Filed June 8, 1970, Ser. No. 23,380
Claims priority, application Canada Jan. 5, 1971
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—150

223,579
MICROPHONE SHOCK MOUNT
Gerald W. Plice, Morton Grove, Ill., assignor to Shure Brothers Incorporated
Filed Feb. 5, 1970, Ser. No. 21,277
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14

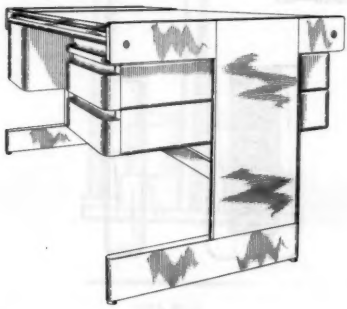


223,580
OMNI-DIRECTIONAL LOUDSPEAKER ENCLOSURE
Paul E. Richards, Los Angeles, Calif., assignor to Promar International, Inc., Chatsworth, Calif.
Filed Dec. 2, 1970, Ser. No. 26,243
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

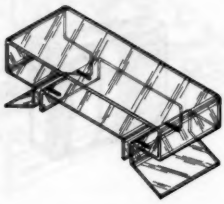


223,581
PLAQUE
Ruppert N. Kohlmaier, Jr., and Joy Wille Kohlmaier, both of 1020 W. William David Parkway, Metairie, La. 70005
Filed May 22, 1970, Ser. No. 23,098
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

223,582
DESK
Douglas C. Ball, Senneville, Quebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Apr. 24, 1970, Ser. No. 22,636
Claims priority, application Canada Nov. 14, 1969
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—7

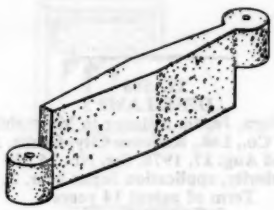


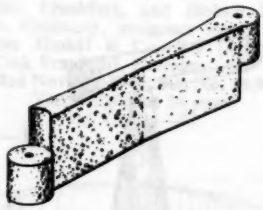
223,583
COFFEE TABLE
John A. Weick, 329 E. 17th St., New York, N.Y. 10003
Continuation-in-part of design application Ser. No. 20,031 Nov. 10, 1969. This application Feb. 10, 1970, Ser. No. 21,391
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



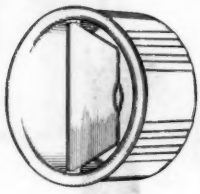
223,584
NOVELTY TYPE DOLL
Howard Nehmer, 3355 Vincent Ave. N., Minneapolis, Minn. 55412
Filed Sept. 16, 1970, Ser. No. 25,021
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—4

223,585
BLOCK FOR PLANTER AND WALL CONSTRUCTIONS
Philip Adelman, 5821 E. Wardlow Road, Long Beach, Calif. 90808
Filed Mar. 23, 1970, Ser. No. 22,021
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D35—1





223,586
CONTAINER FOR PACKAGED SUGAR
James M. Burden, 6256 N. Willard Ave., San Gabriel, Calif. 91775
Filed Sept. 3, 1970, Ser. No. 24,821
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

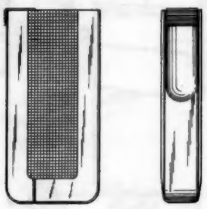


223,587
CASSEROLE
David Douglas, 1119 Lincoln Blvd., Manitowoc, Wis. 54220
Filed Sept. 29, 1970, Ser. No. 25,257
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

223,588
DESK LAMP
Ryuji Ohwa, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma City, Osaka, Japan
Filed Aug. 27, 1970, Ser. No. 24,729
Claims priority, application Japan Mar. 2, 1970
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

223,589
COLUMN LAMP
Theodore Waddell, Via Rio Torto, Fiesole, Italy
Filed Nov. 9, 1970, Ser. No. 25,894
Claims priority, application Italy May 13, 1970
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

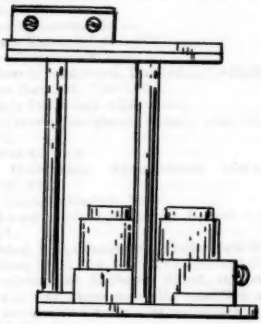
223,590
LIGHTER
Dieter Rams, Konigstein, Taunus, Germany, assignor to Braun AG, Frankfurt am Main, Germany
Filed July 17, 1970, Ser. No. 23,998
Claims priority, application Germany Feb. 17, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27



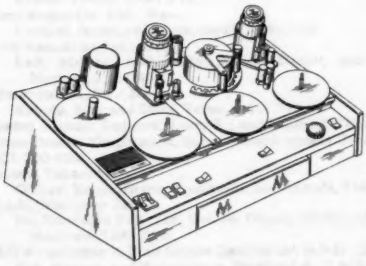
223,591
CIGARETTE LIGHTER OR SIMILAR ARTICLE
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1970, Ser. No. 25,696
Claims priority, application Japan June 4, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

223,592
SPOON
Dyanne E. Durso, 2214 Verde Oak Drive, Hollywood, Calif. 90028
Filed July 6, 1970, Ser. No. 23,824
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

223,593
LENS CLUSTER UNIT FOR PHOTOPRINTING
Richard M. Artz, 3092 Silverton Road NE., Salem, Oreg. 97308
Filed May 28, 1970, Ser. No. 23,198
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1

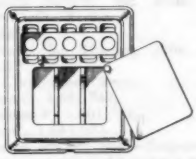


223,594
MICROFILM CONTACT PRINTER
Koji Kazuma and Kokiti Omi, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 16, 1970, Ser. No. 25,027
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1

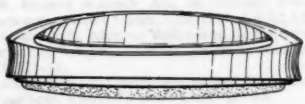


223,595
PIVOTED HOUSING FOR AN ANCHOR
Laverne O. Persinger, Burbank, Calif., assignor of fractional part interest to Merle L. Persinger
Filed Nov. 28, 1969, Ser. No. 20,298
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D71—1

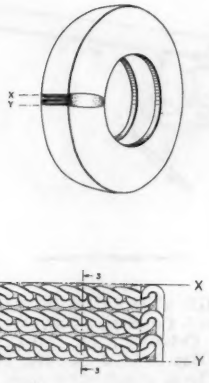
223,596
SYRINGE AND AMPULE WARMER
Charles J. Courtenay, P.O. Box 7182, Orlando, Fla. 32804
Filed Dec. 8, 1970, Ser. No. 25,578
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



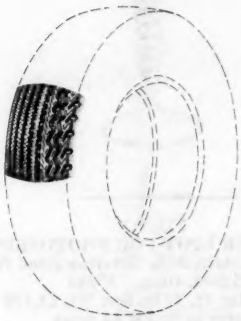
223,597
FABRIC BRUSH
Kurt Krusche, Frankfurt, and Hubert Zimmermann, Mannheim, Germany, assignors to ALLSTAR Verbrauchsguter GmbH & Co. KG (Allstar Consumer Products Co.), Frankfurt, Germany
Filed Nov. 10, 1969, Ser. No. 19,995
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D86—13



223,598
TIRE
Raymond R. Volpe, Elmsford, N.Y., assignor to Wedge House, Inc., Elmsford, N.Y.
Filed Feb. 18, 1970, Ser. No. 21,489
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



223,599
PNEUMATIC TIRE
Robert F. Busch, St. Clair Shores, and William K. Pope, Detroit, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Continuation of design application Ser. No. 14,807, Dec. 5, 1968. This application Oct. 27, 1969, Ser. No. 23,097
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



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TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF MAY, 1972

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Williams, Thomas A., to International Business Machines Corporation. Field effect transistor dynamic logic buffer. 3,662,188, 5-9-72, Cl. 307-233.
Willis, Arnold L.; and Wortman, Harold, to MSL Industries, Inc. Material guide members for a compressing and conveying apparatus. 3,660,964, 5-9-72, Cl. 53-125.

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TO WHOM

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Bradley, Theodore. Disposable office gown. Re. 27,348, 5–9–72, Cl. 2—114.

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Nelson, Donald R., to Goddard Industries, Inc. Top entry valve. Re. 27,358, 5–9–72. Cl. 251—327.

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Skoggard, Bruno B., and W. C. Post, to American Cyanamid Co. Apparatus for forming tubular reinforced plastic members. Re. 27,355, 5–9–72. Cl. 156—432.

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Wiebe, Donald, and R. B. Doorley, to William S. Hansen, d.b.a. A. Stucki Co. Combined rate of flow, pressure and temperature gage. Re. 27,354, 5–9–72. Cl. 73—198.

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Jelly, Robert G. 3,167.

Jelly, Robert G., to E. G. Hill Co., Inc. Yellow rose. 3,166, 5–9–72. Cl. 24.

Jelly, Robert G., to E. G. Hill Co., Inc. Hybrid tea rose. 3,167, 5–9–72, Cl. 14.

Lammerts, Walter E., to Germain's Inc. Rose plant. 3,162, 5–9–72, Cl. 22.

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Littlefield, June F.: *See*—
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Millay, Ruth, assignor to J. F. Littlefield, E. Lavoie, and L. A. Young. Strawberry plant. 3,153, 5–9–72, Cl. 49.

Moore, Ralph S. Rose plant 3,161, 5–9–72, Cl. 10.

Osterman, William T., to Stark Bro's Nurseries & Orchards Co. Pecan tree. 3,158, 5–9–72, Cl. 31.

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Busch, Robert F., and W. K. Pope, to Uniroyal, Inc. Pneumatic tire. 223,599, 5–9–72, Cl. D90—20.

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Dickerson, James E. Footwear heel. 223,558, 5–9–72, Cl. D2—323.

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Kohlmaier, Ruppert N., Jr., and J. W. Kohlmaier. Plaque. 223,581, 5-9-72, Cl. D29—923.
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Magram, Ronald L. Bedstead for children. 223,559, 5-9-72, Cl. D5—4.
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Pittis, Harry, Fisherman's tool. 223,574, 5-9-72, Cl. D22—31.
Plice, Gerald W., to Shure Brothers Inc. Microphone shock mount. 223,579, 5-9-72, Cl. D26—14.
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Richards, Paul E., to Promar International, Inc. Omni-directional loudspeaker enclosure. 223,580, 5-9-72, Cl. D26—14.
Rogers, Walter J. Fishing lure. 223,572, 5-9-72, Cl. D22—28.
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Volpe, Raymond R., to Wedge House, Inc. Tire. 223,598, 5-9-72, Cl. D90—20.
Waddell, Theodore. Column lamp. 223,589, 5-9-72, Cl. D48—20.
Warnecke, Herbert. Conainer for oil or the like. 223,563, 5-9-72, Cl. D9—170.
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CLASSIFICATION OF PATENTS

ISSUED MAY 9, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

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2.1 3,660,849
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67 3,661,691
89 3,661,692
101 3,661,693
109 3,661,625
133 3,661,694
151 3,661,695
204 3,661,696
250 3,661,697

CLASS 162

19 3,661,698
65 3,661,699
103 3,661,700
198 3,661,701
216 3,661,702
271 3,661,703
337 3,661,704
343 3,661,705
3,661,706
392 3,661,707

CLASS 164

85 3,661,196
228 3,661,197
246 3,661,198
274 3,661,199

CLASS 165

42 3,661,200
60 3,661,201
105 3,661,202
167 3,661,203

CLASS 166

.5 3,661,204
65R 3,661,205
85 3,661,206
120 3,661,207
274 3,661,208
278 3,661,209
305D 3,661,210

CLASS 169

2R 3,661,211

CLASS 172

72 3,661,213
258 3,661,212
801 3,661,214
804 3,661,215

CLASS 173

17 3,661,216
93.5 3,661,217

CLASS 174

4C 3,662,083
18 3,662,082
42 3,662,084
48 3,662,085
65R 3,662,087
72B 3,662,088
84C 3,662,089
107 3,662,090
110P 3,662,091
120FP 3,662,092
128 3,662,093
138F 3,662,094
525 3,662,086

CLASS 175

107 3,661,218
260 3,661,219

CLASS 176

28 3,661,708
67 3,661,709

CLASS 177

136 3,661,220
137 3,661,221
178 3,661,222

CLASS 178

3 3,662,095
5.4HE 3,662,097
6.6FS 3,662,101
6.6P 3,662,098
3,662,099
6.6 3,662,100
6.8 3,662,104
7.3S 3,662,096
7.6 3,662,103
7.7 3,662,102
7.88 3,662,106
18 3,662,105

CLASS 179

1HS 3,662,109
1SA 3,662,108
3,662,115
1SW 3,662,107
2TV 3,662,110
5P 3,662,111
3,662,112
15BS 3,662,114
15BT 3,662,113
17E 3,662,116
18GF 3,662,117
90B 3,662,118
100.2C 3,662,119
3,662,122
100.2S 3,662,120
3,662,121
100.2Z 3,662,123
121D 3,662,124
175.2R 3,662,125
175.3 3,662,126

CLASS 180

54D 3,661,223

CLASS 181

.5AP 3,661,224
33R 3,661,225

CLASS 182

142 3,661,226

CLASS 184

106 3,661,227

CLASS 187

25 3,661,228

CLASS 188

32 3,661,229
71.9 3,661,230
72.4 3,661,231
73.4 3,661,232
106A 3,661,233
170 3,661,234
218X 3,661,235
315 3,661,236

CLASS 192

58B 3,661,237
113A 3,661,238

CLASS 195

30 3,661,710
3,661,711
36R 3,661,712
3,661,713
3,661,714
66R 3,661,715
66 3,661,716
103.5R 3,661,717
3,661,718

CLASS 198

20 3,661,239
33AB 3,661,241
33R 3,661,240
34 3,661,242
3,661,243
184 3,661,244
193 3,661,245
202 3,661,246
218 3,661,247

CLASS 200

34 3,662,127
48 3,662,128
61.88 3,662,129
67G 3,662,130
67 3,662,132
84R 3,662,131
144R 3,662,133
146R 3,662,134
148R 3,662,135
157 3,662,136
160 3,662,138
166K 3,662,137

CLASS 201

17 3,661,719

CLASS 202

99 3,661,722
139 3,661,720
172 3,661,721

CLASS 203

8 3,661,723

CLASS 204

1T 3,661,724
3,661,725
10 3,661,726
32R 3,661,728
32S 3,661,727
35N 3,661,729
43 3,661,730
49 3,661,731
51 3,661,732
3,661,733
52Y 3,661,734
64T 3,662,047
67 3,661,736
70 3,661,737
3,661,738
73A 3,661,739
96 3,661,740
143GE 3,661,741
147 3,661,742
158R 3,661,743
159.14 3,661,744
162HE 3,661,745
165 3,661,735
188 3,661,746
192 3,661,747
195S 3,661,749
195 3,661,748
3,661,750
3,661,751
206 3,661,752
212 3,661,753
228 3,661,754
271 3,661,755
286 3,661,756
290F 3,661,757
298 3,661,758
3,661,759
3,661,760
3,661,761
301 3,661,762
321 3,661,763
325 3,661,764

CLASS 206

5A 3,661,248
45.33 3,661,249
52F 3,661,250
56DF 3,661,251
62R 3,661,252
65R 3,661,253

CLASS 208

6 3,661,765
25 3,661,766
54 3,661,767
139 3,661,768
3,661,769
240 3,661,771
289 3,661,772
321 3,661,773

CLASS 209

5 3,661,254
74 3,661,255
3,661,256
101 3,661,257
111.7 3,661,258
123 3,661,259

CLASS 210

21 3,661,774
37 3,661,775
63 3,661,778
74 3,661,260
83 3,661,261
169 3,661,262
242 3,661,263
3,661,264
359 3,661,265
370 3,661,266
510 3,661,267

CLASS 211

49R 3,661,268
3,661,269
62 3,661,270
88 3,661,271
105.1 3,661,272
169 3,661,273

CLASS 212

1 Re.27,349
68 3,661,274

CLASS 213

20 3,661,275

CLASS 214

1CM 3,661,276
1.6 3,661,277
8.5K 3,661,278
15R 3,661,279
16.4A 3,661,280
83.3 3,661,281
152 3,661,282
3,661,283
3,661,284
302 3,661,285
506 3,661,286
520 3,661,287

CLASS 215

11R 3,661,288
41 3,661,289

CLASS 219

10.55 3,662,139
3,662,140
3,662,141
69G 3,662,142
3,662,143
73 3,662,144
98 3,662,145
110 3,662,146
131R 3,662,147
136 3,662,148
201 3,662,149
209 3,662,150
233 3,662,151
241 3,662,152
265 3,662,153
271 3,662,154
432 3,662,155

CLASS 220

1R 3,661,290
42B 3,661,291
43R 3,661,292
71 3,661,293
83 3,661,294
88A 3,661,295
94A 3,661,296
113 3,661,297

CLASS 221

171 3,661,298

CLASS 222

3 3,661,299
80 3,661,300
92 3,661,301
226 3,661,302
309 3,661,303
394 3,661,304
481 3,661,305
504 3,661,306

CLASS 223

46 3,661,307

CLASS 224

5V 3,661,308

CLASS 226

97 3,661,309
108 3,661,310
198 3,661,311

CLASS 227

8 3,661,312
136 3,661,313

CLASS 228

15 3,661,314
20 3,661,315
56.5 3,661,316

CLASS 229

2.5 3,661,317
23BT 3,661,318
37 3,661,319
43 Re.27,361
44 3,661,320
51SC 3,661,321
55 3,661,322

CLASS 235

61.12 3,662,156
92FL 3,662,157
92PC 3,662,158
150.3 3,662,159
150.53 3,662,160
156 3,662,161
186 3,662,162
197 3,662,163

CLASS 236

93 3,661,323
98 3,661,324

CLASS 237

8R 3,661,325

CLASS 239

60 3,661,326
569 3,661,327

CLASS 240

10.68 3,662,166
25 3,662,164
103R 3,662,165

CLASS 241

18 3,661,328
28 3,661,329
65 3,661,330
92 3,661,331
222 3,661,332
281 3,661,333

CLASS 242

18DD 3,661,334
25A 3,661,335
55.19A 3,661,336
55.19R 3,661,337
67.1 3,661,338
71.6 3,661,339
86.008 3,661,340
115 3,661,341
118.41 3,661,342
141 3,661,343
199 3,661,344
3,661,345

CLASS 244

3.16 3,661,346
77D 3,661,347
110C 3,661,348

CLASS 246

2F 3,662,167
169D 3,662,168

CLASS 248

46 3,661,349
146 3,661,350
210 3,661,351
429 3,661,352

CLASS 249

103 3,661,353
192 3,661,354

CLASS 250

44 3,662,177
49.5TC 3,662,169
83CD 3,662,178
83.3D 3,662,174
83.3H 3,662,170
3,662,171
83.3R 3,662,172
3,662,173
3,662,179
86 3,662,175
199 3,662,180
218 3,662,176
219D 3,662,181

CLASS 251

62 3,661,357
144 3,661,355
147 Re.27,353
299 3,661,356
327 Re.27,358

CLASS 252

3 3,661,776
8.55B 3,661,785
33 3,661,777
49.3 3,661,784
49.6 3,661,779
59 3,661,780
62.9 3,661,781
79 3,661,782
79.2 3,661,783
99 3,661,786
109 3,661,787
171 3,661,788
186 3,661,789
301.3R 3,661,790
301.4P 3,661,791
3,661,792
321 3,661,793
354 3,661,794
356 3,661,795
392 3,661,796
408 3,661,797
416 3,661,798
417 3,661,799
3,661,800
430 3,661,802
431C 3,661,803
435 3,661,801
441 3,661,804
465 3,661,805
470 3,661,806

CLASS 253

92 3,661,450

CLASS 254

134.3R 3,661,358

CLASS 256

1 3,661,359
37 3,661,360

CLASS 259

1R 3,661,361
3,661,362
7 3,661,363

95 3,661,364
154 3,661,365

CLASS 260

2.5AC 3,661,808
2.5AJ 3,661,809
2.5AN 3,661,811
2.5HA 3,661,813
2.5B 3,661,810
2.5F 3,661,812
2.5M 3,661,807
17.2 3,661,814
17.4BB 3,661,823
17.4CC 3,661,815
18S 3,661,816
3,661,817
3,661,887
19EP 3,661,818
21 3,661,819
22A 3,661,820
23AR 3,661,824
23EP 3,661,821
23.5A 3,661,822
23.7M 3,661,825
28.5B 3,661,826
29.1R 3,661,828
29.4R 3,661,829
29.6MN 3,661,827
30.8R 3,661,830
32.8A 3,661,831
33.4P 3,661,832
33.8SB 3,661,833
34.2 3,661,834
3,661,835
37N 3,661,836
3,661,837
41AG 3,661,839
41A 3,661,838
41.5R 3,661,840
45.75N 3,661,843
45.8R 3,661,841
45.9 3,661,842
45.95 3,661,844
46.5E 3,661,847
46.5R 3,661,845
3,661,846
47CP 3,661,849
47ET 3,661,848
50 3,661,850
65 3,661,852
67FP 3,661,853
3,661,854
67R 3,661,855
75NR 3,661,857
75R 3,661,858
75S 3,661,856
77.5AC 3,661,885
77.5AP 3,661,862
77.5AX 3,661,860
77.5CH 3,661,859
77.5R 3,661,861
78TF 3,661,863
78 3,661,864
78.4D 3,661,866
78.4 3,661,865
78.5CL 3,661,867
80.3N 3,661,868
80.7 3,661,870
80.78 3,661,869
3,661,871
83.3 3,661,874
85.1 3,661,872
3,661,873
85.5 3,661,875
86.1 3,661,876
86.7 3,661,877
88.2F 3,661,878
88.3R 3,661,879
89.5N 3,661,880
92.8W 3,661,881
93.7 3,661,884
94.3 3,661,882
3,661,883
156 3,661,886
187 3,661,888
207.1 3,661,889
210E 3,661,891
210F 3,661,890
210R 3,661,892
211.5R 3,661,893
233.5 3,661,895
239.3R 3,661,894
239.3T 3,661,896
239.55R 3,661,897
240F 3,661,899
240G 3,661,898
243C 3,661,901
243R 3,661,900
3,661,902
247.2A 3,661,903
250A 3,661,904
250R 3,661,905
256.4C 3,661,907
256.4Q 3,661,906
256.5R 3,661,908
268TR 3,661,909
3,661,910
270R 3,661,911
281 3,661,912
286Q 3,661,913
287R 3,661,914
289R 3,661,915
292 3,661,916
293.52 3,661,918
293.73 3,661,917
297R 3,661,919
302R 3,661,920
304 3,661,921
307A 3,661,926
307F 3,661,922
3,661,923
309 3,661,924
309.2 3,661,925
309.6 3,661,927
310D 3,661,928
326.11 3,661,931
326.5D 3,661,929
327R 3,661,930
340 3,661,932
340.3 3,661,933
343.2R 3,661,935
346.3 3,661,937
347.3 3,661,936
347.5 3,661,934
348A 3,661,938
397.2 3,661,939
397.3 3,661,940
3,661,941
3,661,942
397.4 3,661,943
397.6 3,661,944
401 3,661,945
403 3,661,946
407 3,661,956
408 3,661,947
410.9R 3,661,948
413 3,661,949
3,661,950
3,661,951
3,661,957
429.7 3,661,958
430 3,661,959
437R 3,661,952
439R 3,661,953
3,661,960
448.2E 3,661,962
448.2H 3,661,961
448.2N 3,661,954
3,661,963
448.8R 3,661,964
464 3,661,965
465E 3,661,969
465F 3,661,967
465.008 3,661,968
465.2 3,661,970
3,661,973
465.5 3,661,971
468R 3,661,972
470 3,661,974
471A 3,661,975
479R 3,661,976
482C 3,661,966
482R 3,661,977
484B 3,661,955
486AC 3,661,979
486R 3,661,978
488H 3,661,980
497A Re.27,360
501.2 3,661,981
3,661,982
513.5 3,661,983
524R 3,661,984
530R 3,661,986
3,661,987
533R 3,661,988
553A 3,661,989
555C 3,661,985
556F 3,661,990
558D 3,661,991
570.7 3,661,993
570.8R 3,661,992
583K 3,661,995
584C 3,661,996
586R 3,661,998
586 3,661,997
590 3,661,999
593 3,662,000
594 3,662,001
609A 3,662,002
609R 3,661,851
3,662,003
3,662,004
612D 3,662,005
613D 3,662,006
631.5 3,662,007
3,662,008
653.3 3,662,009
666PY 3,662,010
668A 3,662,011
672T 3,662,012
674SA 3,662,014
674A 3,662,013
677H 3,662,015
681 3,662,016
681.5 3,662,017
683.15D 3,662,021
683.3 3,662,018
3,662,019
683.43 3,662,020
683.68 3,661,770
837R 3,662,022
858 3,662,023
863 3,662,024
3,662,025
879 3,661,994
880R 3,662,026
891 3,662,027
899 3,662,028
920 3,662,029
3,662,030
927R 3,662,031
930 3,662,032
953 3,662,033
3,662,035
957 3,662,034
968 3,662,037
969 3,662,036
985 3,662,038
986 3,662,039

CLASS 261

5 3,661,366
41D 3,661,367
63 3,661,368

CLASS 263

2R 3,661,369
33R 3,661,370

CLASS 264

.5 3,662,042
1 3,662,040
3,662,041
26 3,662,043
34 3,662,044
35 3,662,045
41 3,662,046
85 3,662,048
89 3,662,049
102 3,662,050
107 3,662,051
119 3,662,052
129 3,662,053
131 3,662,054
167 3,662,055
290R 3,662,056
321 3,662,057
332 3,662,058

CLASS 266

5R 3,661,371
15 3,661,372
34T 3,661,373
39 3,661,374

CLASS 267

137 3,661,375

CLASS 269

75 3,661,376
88 3,661,377
131 3,661,378
465.8 3,661,968

CLASS 270

54 3,661,379

CLASS 271

14 3,661,380
26 3,661,381
44 3,661,382
51 3,661,383
88 3,661,384

CLASS 272

8M 3,661,385
33R 3,661,386

CLASS 273

1M 3,661,387
80.2 3,661,388
95C 3,661,389
129 3,661,390
131A 3,661,391
152.1 3,661,392
153R 3,661,393

CLASS 274

4B 3,661,395
4C 3,661,394
4D 3,661,396
9RA 3,661,397

CLASS 277

26 Re.27,350
74 3,661,398
94 3,661,399
134 3,661,400
227 3,661,401
235A 3,661,402

CLASS 279

5 3,661,403

CLASS 280

255 3,661,404

CLASS 281

42 3,661,405

CLASS 283

55 3,661,407

CLASS 285

18 3,661,408
87 3,661,409

CLASS 287

20.924 3,661,410
103A 3,661,411
189.36F 3,661,406

CLASS 292

218 3,661,412
238 3,661,413

CLASS 294

59 3,661,414
81R 3,661,415
83 3,661,416
87.2 3,661,417

CLASS 296

23MC 3,661,418
24R 3,661,419
43 3,661,420

CLASS 297

284 3,661,422
417 3,661,421

CLASS 299

2 3,661,423
4 3,661,424

CLASS 301

63R 3,661,425

CLASS 303

6C 3,661,426
21CF 3,661,428
21F 3,661,427
54 3,661,429

CLASS 305

9 3,661,430

CLASS 307

64 3,662,182
88.3 3,662,183
106 3,662,184
3,662,185
141 3,662,186
229 3,662,187
233 3,662,188
252L 3,662,189
252N 3,662,190
254 3,661,026
270 3,662,191
291 3,662,193
293 3,662,192

CLASS 308

6R 3,661,431
9 3,661,432
72 3,661,433

CLASS 310

9.4 3,662,194
64 3,662,195
68B 3,662,196
78 3,662,197
89 3,662,198
208 3,662,199
211 3,662,200
220 3,662,201
239 3,662,202

CLASS 312

111 3,661,434
321 3,661,435

CLASS 313

25 3,662,203
34 3,662,205
68D 3,662,204
94 3,662,206
104 3,662,207
112 3,662,208
237 3,662,209
311 3,662,210
340 3,662,211

CLASS 315

3.5 3,662,212
149 3,662,213
167 3,662,214
189 3,662,215
205 3,662,216

CLASS 317

4 3,662,217
18D 3,662,218
28R 3,662,219
36TD 3,662,220
62 3,662,221
98 3,662,222
99 3,662,223
101DH 3,662,224
118 3,662,225
134 3,662,226
135 3,662,227
148.5R 3,662,228
3,662,229
234R 3,662,230
3,662,231
234 3,662,232
235R 3,662,234
235T 3,662,233
249T 3,662,235
260 3,662,236

CLASS 318

254 3,662,237
3,662,238
270 3,662,239
325 3,662,240
473 3,662,241
573 3,662,242
588 3,662,243
626 3,662,244
663 3,662,246
696 3,662,245

CLASS 321

5 3,662,247
11 3,662,248
3,662,249
3,662,250

CLASS 322

23 3,662,251
89 3,662,252

CLASS 323

43.5S 3,662,253
45 3,662,254

CLASS 324

3 3,662,255
29 3,662,256
34PS 3,662,257
41 3,662,258
51 3,662,259
72 3,662,260
78R 3,662,261
94 3,662,262
96 3,662,263
142 3,662,264
157 3,662,265

CLASS 325

38B 3,662,266
53 3,662,267
56 3,662,268
63 3,662,269
390 3,662,270
459 3,662,271

CLASS 328

104 3,662,272
151 3,662,273

CLASS 329

192 3,662,274

CLASS 330

1A 3,662,275
3,662,276
30D Re.27,351

CLASS 331

2 3,662,277
17 3,662,278
94 3,662,283
94.5 3,662,279
3,662,280
3,662,281
3,662,282
3,662,284
107R 3,662,285
108 3,662,286
117 3,662,287

CLASS 332

3 3,662,289
38 3,662,290

CLASS 333

1.1 3,662,291
29 3,662,292
30R 3,662,293
33 3,662,294

CLASS 334

7 3,662,295

CLASS 335

68 3,662,299
97 3,662,300
112 3,662,301
192 3,662,288
219 3,662,302
284 3,662,303
297 3,662,304

CLASS 336

84 3,662,305
119 3,662,306
178 3,662,307
210 3,662,308

CLASS 337

202 3,662,309
290 3,662,310
367 3,662,311

CLASS 338

4 3,662,312
32H 3,662,315
90 3,662,313
163 3,662,314
174 3,662,317

CLASS 339

17R 3,662,318
28 3,662,319
36 3,662,296
37 3,662,320
60R 3,662,297
92M 3,662,321
95B 3,662,322
198GA 3,662,298
198M 3,662,323
255R 3,662,324

CLASS 340

15 3,662,326
15.5DS 3,662,325
17 3,662,327
33 3,662,328
37 3,662,329
38R 3,662,330
40 3,662,331
51 3,662,332
52C 3,662,333
52D 3,662,334
58 3,662,335
81F 3,662,336
146.1AL 3,662,337
146.1AQ 3,662,338
146.2 3,662,339
3,662,340
146.3SG 3,662,341
147 3,662,342
149 3,662,343
162 3,662,344
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174.1M 3,662,364
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324A 3,662,373
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347AD 3,662,376
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347DA 3,662,379
347DD 3,662,378
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9 3,662,384
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17.1PF 3,662,386
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100AP 3,662,389
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3,662,398
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186 3,661,445
214 3,661,446
225 3,661,447

CLASS 352

91 3,661,448

CLASS 353		36	3,661,460	239	3,661,473	52	3,662,059	273	3,662,069	297	3,661,491
88	3,661,449	51	3,661,462	**CLASS 415**		57	3,662,060	274	3,662,070	307	3,661,492
92	3,661,450	106	3,661,463	143	3,661,474	64	3,662,061	275	3,662,071	**CLASS 431**	
117	3,661,451		3,661,464	**CLASS 416**		85	3,662,062	299.004	3,661,424	4	3,661,493
CLASS 355		162	3,661,465	219	3,661,475	101	Re.27,359	**CLASS 425**			3,661,494
3	3,661,452	217	3,661,466	**CLASS 417**		145	3,662,064	62	3,661,481	7	3,661,495
	3,661,453	**CLASS 401**		341	3,661,476	181	3,662,063	66	3,661,482		3,661,496
	3,661,454	138	3,661,467	373	3,661,477	198	3,662,065	72	3,661,483		3,661,497
14	3,661,455	206	3,661,468	437	3,661,479	204	3,662,066	109	3,661,484	275	3,661,498
37	3,661,461	**CLASS 408**		555	3,661,478	230	3,662,072	162	3,661,485	328	3,661,499
66	3,661,456	72	3,661,469	**CLASS 418**		245	3,662,067	174	3,661,486	**CLASS 444**	
78	3,661,457	137	3,661,470	179	3,661,480	250	3,662,073	191	3,661,487	1	3,662,400
88	3,661,458	220	3,661,471	**CLASS 424**		253	3,662,068	196	3,661,488		3,662,401
CLASS 356		231	3,661,472			265	3,662,074	233	3,661,489		3,662,402
4	3,661,459							243	3,661,490		

CLASSIFICATION OF DESIGNS

D 2—	232	223,557			223,565	D22—	5	223,573	D26—	14	223,579	D44—	15	223,586	D61—	1	223,593
	323	223,558			223,566		28	223,572			223,580			223,587			223,594
D 5—	4	223,559			223,567		31	223,574	D29—	23	223,581	D48—	20	223,588	D71—		223,595
D 8—	58	223,561	D14—	6	223,568	D23—	57	223,575	D33—	7	223,582			223,589	D83—		223,596
	267	223,560	D15—	1	223,569		69	223,576		14	223,583		27	223,590	D86—	13	223,597
D 9—	170	223,563			223,570		112	223,577	D34—	4	223,584			223,591	D90—	20	223,598
	196	223,562	D18—	2	223,571		150	223,578	D35—	1	223,585	D54—	12	223,592			223,599
D13—	1	223,564															

CLASSIFICATION OF PLANTS

P. —	10	3,161	P. —	22	3,162	P. —	32	3,159	P. —		3,164	P. —	49	3,153	P. —	86	3,160
P. —	14	3,167	P. —	24	3,166	P. —	37	3,157	P. —	41	3,165	P. —	57	3,155	P. —	88	3,156
P. —	20	3,163	P. —	31	3,158	P. —	38	3,154									

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Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	3,662,389	3,661,255	3,661,803	8	3,661,006	3,661,971	3,661,016
2	3,661,263	3,661,268	3,661,826		3,661,309	3,662,069	3,661,018
	3,661,264	3,661,284	3,661,840		3,661,391	3,662,071	3,661,023
4	Re.27,351	3,661,286	3,661,882		3,661,595	3,662,337	3,661,036
	3,660,934	3,661,288	3,661,890		3,661,718	3,660,991	3,661,039
	3,661,049	3,661,305	3,661,914		3,661,857	3,661,070	3,661,042
	3,661,740	3,661,308	3,661,941		3,662,077	3,661,360	3,661,046
	3,662,162	3,661,315	3,661,943		3,662,365	3,661,405	3,661,050
	3,662,352	3,661,338	3,661,949		3,662,374	3,661,414	3,661,053
	3,662,402	3,661,347	3,661,998		3,662,397	3,661,834	3,661,073
5	3,660,910	3,661,356	3,662,031		3,662,398	3,661,933	3,661,078
6	Re.27,348	3,661,359	3,662,040	9	Re.27,349	3,661,983	3,661,097
	Re.27,360	3,661,361	3,662,078		3,660,851	3,662,076	3,661,100
	3,660,878	3,661,366	3,662,094		3,660,895	3,662,102	3,661,104
	3,660,880	3,661,376	3,662,096		3,660,940	3,662,112	3,661,121
	3,660,887	3,661,377	3,662,099		3,661,013	3,662,212	3,661,152
	3,660,897	3,661,403	3,662,101		3,661,029	3,662,260	3,661,187
	3,660,900	3,661,407	3,662,104		3,661,051	3,662,285	3,661,197
	3,660,904	3,661,408	3,662,107		3,661,059	3,662,338	3,661,200
	3,660,906	3,661,413	3,662,111		3,661,085	3,660,960	3,661,201
	3,660,918	3,661,420	3,662,139		3,661,204	3,660,994	3,661,210
	3,660,933	3,661,423	3,662,150		3,661,242	3,661,106	3,661,225
	3,660,946	3,661,431	3,662,154		3,661,383	3,661,259	3,661,230
	3,660,952	3,661,457	3,662,158		3,661,422	3,661,297	3,661,234
	3,660,956	3,661,472	3,662,171		3,661,558	3,661,331	3,661,243
	3,660,987	3,661,486	3,662,178		3,661,699	3,661,417	3,661,261
	3,661,011	3,661,486	3,662,185		3,661,702	3,661,515	3,661,267
	3,661,047	3,661,517	3,662,193		3,661,753	3,661,551	3,661,292
	3,661,083	3,661,520	3,662,198		3,661,790	3,661,691	3,661,310
	3,661,084	3,661,525	3,662,204		3,661,809	Re.27,361	3,661,312
	3,661,087	3,661,527	3,662,205		3,661,816	Re.27,353	3,661,313
	3,661,090	3,661,530	3,662,216		3,661,819	3,661,514	3,661,336
	3,661,098	3,661,544	3,662,222		3,661,887	3,660,859	3,661,341
	3,661,112	3,661,586	3,662,244		3,661,989	3,660,869	3,661,342
	3,661,117	3,661,589	3,662,251		3,662,013	3,660,879	3,661,354
	3,661,140	3,661,625	3,662,252		3,662,041	3,660,879	3,661,396
	3,661,143	3,661,634	3,662,261		3,662,153	3,660,884	3,661,410
	3,661,147	3,661,641	3,662,274		3,662,157	3,660,888	3,661,418
	3,661,148	3,661,644	3,662,281		3,662,179	3,660,909	3,661,451
	3,661,178	3,661,657	3,662,287		3,662,278	3,660,911	3,661,453
	3,661,180	3,661,675	3,662,291		3,662,301	3,660,914	3,661,474
	3,661,181	3,661,679	3,662,303		3,662,342	3,660,919	3,661,483
	3,661,190	3,661,684	3,662,330	10	3,661,320	3,660,938	3,661,483
	3,661,198	3,661,686	3,662,347		3,661,461	3,660,964	3,661,487
	3,661,202	3,661,689	3,662,358		3,661,556	3,660,977	3,661,487
	3,661,209	3,661,696	3,662,361		3,661,588	3,660,985	3,661,488
	3,661,213	3,661,724	3,662,380		3,661,734	3,660,986	3,661,492
	3,661,214	3,661,728	3,662,383		3,661,813	3,660,995	3,661,539
	3,661,229	3,661,758	3,662,386		3,661,854	3,661,000	3,661,549
	3,661,239	3,661,759	3,662,388		3,661,875	3,661,001	3,661,568
	3,661,240	3,661,779	3,662,393		3,661,959	3,661,003	3,661,590

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DESIGN PATENTS

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PLANT PATENTS

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